UI / UX Design Model for Student Complaint Handling Application Using Design Thinking Method (Case Study: STMIK Rosma Karawang)

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Abstract.
The development of information technology is currently very rapid and unavoidable, especially in the world of education. Global demands require the education sector to constantly adjust technological developments with efforts to improve the quality of education, adjust the use of information and communication technology. STMIK Rosma is a university that utilizes computer technology. However, there are still shortcomings, namely the absence of a student complaint application so that the process of submitting student complaints is still running manually. This results in not recording student complaints, student complaint data not well documented, so that the college leadership of the campus cannot monitor the complaints submitted by students. This study aims to analyze the functional requirements of the STMIK Rosma student complaint application. The method used in this research is Design Thinking. The result of this research is the UI / UX design of the student complaint handling application (mobile application) at STMIK Rosma Karawang which is designed using the classic mockuplus tools. This research is expected to provide suggestions to universities to improve the process of handling student complaints.

Keywords: Complaint Handling, Design Thinking, Student, UI / UX

I.   INTRODUCTION

The development of information technology increasingly facilitates the exchange of information, so that place, time and distance are no longer a constraint. The rapid development of information technology is inseparable from the development of computer technology, one of which is in the education sector, global demands require the education sector to constantly adapt technological developments with efforts to improve the quality of education, adjust the use of information and communication technology today. With the existence of information technology, it will also greatly facilitate universities to produce information and facilitate all university activities related to data processing and report generation[1]. Information obtained from the information system (information system) is a system within the organization that brings together daily transaction processing needs to support operational activities, both managerial and strategic activities that are able to provide reports in the form of activity information to interested parties[2][3][4].

Rosma College of Informatics and Computer Management (STMIK) is a university that utilizes information systems. However, there are still shortcomings, namely the absence of an application for handling student complaints so that there is

no time efficiency in submitting student complaints, student complaints are not recorded, and staff cannot document complaints that have been resolved, and the leadership of campus universities cannot monitor student complaints. STMIK Rosma has difficulty in handling student complaints because there is no computerized process for handling complaints. This resulted in poor handling and reduced performance because the handling was still manual so that it was no longer effective in handling complaints. At every institution or company there must be complaints that are felt by someone.

Submission of student aspirations and complaints is important in an institution or higher education, because with the delivery of these aspirations an institution can easily improve and improve its quality[5]. In simple terms, a complaint is an unpleasant feeling or situation[6]. According to Tjiptono, complaints are expressions of dissatisfaction or disappointment[7]. According to Lovelock & Wright (2002) complaints are a form of formal expression of dislike or dissatisfaction with some aspects that are received by a person[8]. If there is a complaint against an institution or certain aspects of an institution, it must be handled immediately. Handling a complaint given by someone earlier is a wise and appropriate attitude because the institution is better able to anticipate things that can be detrimental or unwanted, no matter how small a person's disappointment with the institution is a complaint that must be handled.Several previous studies as stated by [9][10][11][12] and [13] that the design thinking approach is used to create new ideas in the development of a product that is suitable for users. And the use of design thinking can be used to find innovative solutions to a problem[14][15]. Design Thinking from Stanford University which consists of five stages starting from empathize, define, ideate, prototype and test[16]. This cycle proved to be the fastest way to get innovative design results[17].

Design thinking is a tool used in problem-solving, problem-design, to problem-forming[18]. Not only to solve a problem, but also to shape and design a problem. In the process, design thinking is human-centered or human-centered[19]. Every design thinking process originates and is aimed at humans. The application of the design function is widely applied in various ways, such as for the education, tourism, business and other sectors.Seeing the obstacles that occur in handling student complaints from STMIK Rosma Karawang, researchers are interested in making a UI/UX design model for student complaint handling applications by innovating in the form of a mobile application that is specifically designed to address and assist campus operations when handling student complaints. to be more effective and efficient. This design uses the design thinking method (emphatize, define, ideate, prototype and testing). The results of this study provide recommendations in the form of a UI/UX model on a mobile application by identifying the information needs problems contained in handling student complaints from STMIK Rosma. This application design model is designed based on the target user in facilitating and acting as an intermediary for submitting complaints made by students.

II.   METHODS

This research has a design science paradigm rooted in the realm of artificial science and technology. This paradigm is a paradigm of problem solving. This paradigm focuses on finding innovations that define ideas, practices, technical competencies, and products through a series of processes of analysis, design, implementation, management and use of information systems that can be used effectively and efficiently. The design science paradigm is aimed at how IT artifacts are developed through a set of processes and methodologies[20]. In this study, researchers will dig up information on handling student complaints at STMIK Rosma Karawang. This study uses a design thinking approach. There are five steps to this approach: definition, empathy, idea, prototype, and test. However, in this study, the researcher only used four stages, only up to making a prototype.
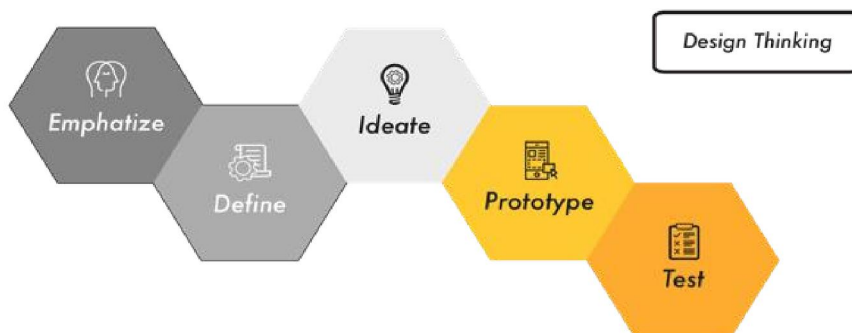
Fig 1. The Stage Diagram In The Design Thinking Method
Source: [10]

III.   RESULT AND DISCUSSION

1.   Empathy Results

In this empathize process, observations and interviews were conducted. Observations are made through user behavior in using AIS and complaints. Then the interview was conducted by asking questions to the interviewees directly to obtain valid data[21]. This empathy stage is an activity regarding data collection. In the empathy stage, researchers conducted interviews with students and related staff based on the criteria of resource persons who had submitted complaints and related staff who had handled student complaints to obtain information about the process of handling student complaints at STMIK Rosma. Based on the results of the interview, it can be concluded that the process of handling student complaints is currently running manually which causes no documented complaint data submitted by students.

2.   Define Results

After the data collection process is in the empathy stage, the next step is the define stage. This define stage aims to analyze the current business processes that are

currently running and to identify existing problems based on existing business processes and based on the results of previous data collection.

a.   Current Business Process Analysis (As-Is)

Based on the results of data collection, it can be seen that the business process is running the process of handling student complaints at STMIK Rosma. The running business process can be seen in the image below.
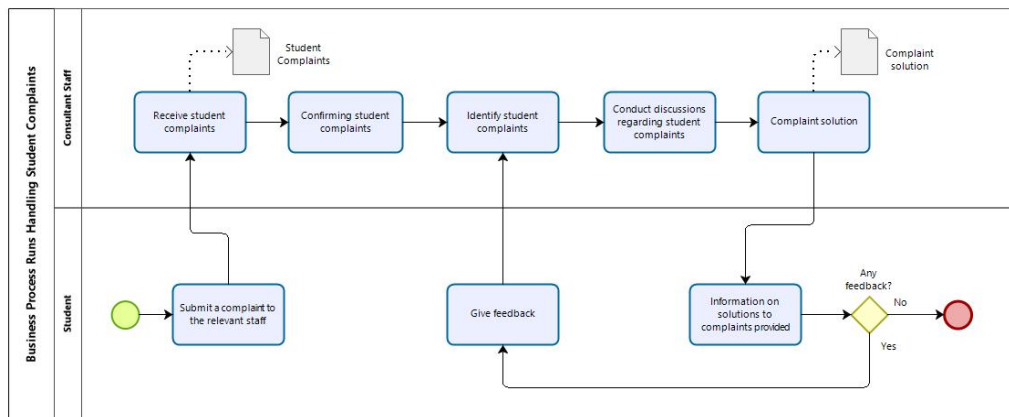

Fig 2. Ongoing Business Process for Handling Student Complaints

The explanation of the business process model (as-is) for Handling Student Complaints can be seen in Table 1.

Table 1. Description of Current Business Process Handling Student Complaints

Actor	Symbol	Description	Document
Student	*Start Event*	Students start the business process of handling student complaints.	-
Student	*Task*	Students submit their complaints to the relevant staff.	-
Consultant Staff	*Task*	Receive information on complaints submitted by students.	Student complaint data.
Consultant Staff	*Task*	Confirm the complaints submitted by students.	-
Consultant Staff	*Task*	Identify complaints based on previously obtained information.	-
Consultant Staff	*Task*	Conduct discussions and process complaints submitted by students.	-
Consultant Staff	*Task*	Provide solutions to complaints that have been submitted based on the results of previous discussions.	Complaint solution.
Student	*Task*	Receive solution information provided by consulting staff.	-
Student	*Gateway*	Students decide whether the given solution is accepted or not.	-
Student	*Task*	If the student does not accept the solution given, then the student gives a response to the consulting staff. The process will then return to the	-

Actor	Symbol	Description	Document
		identification of problems by the consultant staff.	
Student	*End Event*	If the student accepts the solution provided, then the flow of the student complaint handling process is complete.	-

b.   *Problem Analysis*

After describing the current business process for handling student complaints, the next step is to analyze the problem based on the current business process that has been created previously. The problem analysis aims to find out what obstacles are faced during the process of handling student complaints.

Table 2. Analysis of Student Complaints Handling Problems

No.	Problem	Reason
1.	The process of handling student complaints takes quite a long time.	The long complaint handling time is caused by waiting for information between the relevant staff involved in handling the complaint.
2.	There is no clear information related to the status of handling student complaints.	There is no system that gives students the status of complaints, so that information about complaints submitted is only verbal or through social media such as whatsapp.
3.	There is no procedure regarding the process of handling student complaints.	Handling student complaints is only based on previous experience.
4.	Service for student complaints in providing information cannot be fast.	The process of handling complaints and information provided by students is still manual, causing queues between students and one another.
5.	Repeated student complaints.	There is no system that records the history of any complaints that have been submitted by students.
6.	Student complaint data is vulnerable to being lost or known by others.	There is no special access right to access data on complaints submitted by students.
7.	Student complaint data is not well documented.	There is no system to archive complaint data submitted by students.

3.   *Ideate Results*

At this stage the description of solutions from various ideas that have been discussed[22]. The Ideate stage is the next stage after the define stage. At the define stage, the results of business process analysts have been obtained, handling student complaints and problems in the process to be included in the ideate stage, at this stage the researcher makes solutions to problems that have been determined and proposed business processes (to-be) in the student complaint handling process.

a.   *Solution Analysis*

Based on the results of the problem analysis at the define stage, the researchers analyzed the problem solution. Analysis of the problem solution to be carried out is to

identify the root of the problem from the results of the problem-cause analysis, the solution can be seen in the table below.

Table 3. Solution Analysis Results

No.	Root of the problem	Solution
1.	Handling student complaints takes a long time.	Designing an integrated student complaint handling system/application so that there is no need to manually check the staff involved in handling complaints, because the system will synchronize automatically and accurately.
2.	There is no status of the complaint handling process.	Adding a complaint status feature to the student complaint handling application so that students get clear information about complaints that have been processed to a certain stage.
3.	There is no written procedure for handling student complaints.	Create a business process for handling student complaints as a reference in handling complaints submitted by students.
4.	The information provided regarding the handling of complaints cannot be done quickly.	Added a complaint status feature as described previously, so that students can get information about their complaints easily.
5.	Repeated student complaints.	Adding a history feature to the student complaint handling application, so that students do not submit the same complaint because information about complaints that have been submitted by students is recorded by the application.
6.	There is no special access right to access student complaint data.	Menambahkan fitur keamanan seperti *login*, sehingga hanya orang yang mempunyai *username* dan *password* yang dapat mengakses aplikasi penanganan keluhan mahasiswa tersebut.
7.	There is no system that documents student complaint data.	With the application for handling student complaints, all student complaint data will be automatically entered into the application database. Making it easier for related staff to facilitate report generation.

b.   *Proposed Business Process Analysis (To-be)*

After knowing the business processes running and the problems that exist in handling student complaints, the researcher makes a business process proposal to improve the existing business processes. The business process of the proposed handling of student complaints can be seen in the image below.
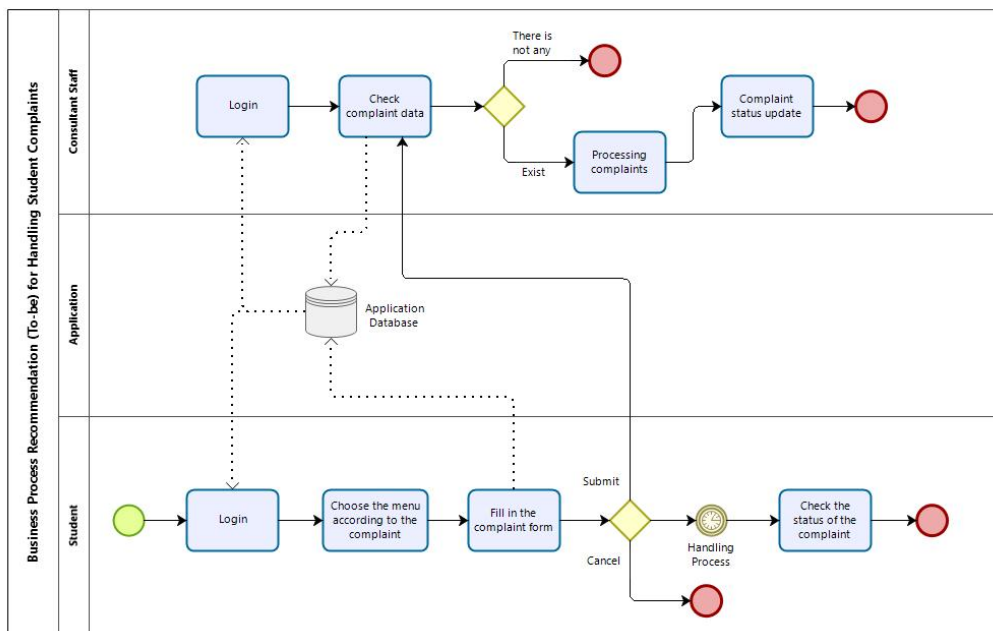
Fig 3. Business Process for Student Complaint Handling Recommendations

    The explanation of the proposed business process model (to be) for Handling Student Complaints can be seen in the table below.

Table 4. Description of the Business Process of the Proposed Complaint Handling

Actor	Symbol	Description	Document
Student	*Start Event*	Students start the business process of handling student complaints.	-
Student	*Task*	Students login to the student complaint handling application.	-
Student	*Task*	Select the complaint menu in accordance with the complaint addressed. There are three complaint menus, namely complaints to BAAK, BAUK, and SARPRAS, students can choose one of the menus according to their needs.	-
Student	*Task*	Fill out the student complaint form according to the previously selected complaint menu.	Student complaint data.
Application	*Database*	All complaint data entered by students is stored in the application database.	-
Student	*Gateway*	After filling out the complaint form, the student can decide whether to send it or not. If a student sends a complaint that has been filled in previously, the process will continue to the next stage, otherwise the student complaint handling flow is complete.	-
Consultant Staff	*Task*	The staff logs in to be able to access the complaint handling application.	-
Consultant	*Task*	Checking student complaint data.	-

Actor	Symbol	Description	Document
Staff			
Consultant Staff	*Gateway*	If there is new data on student complaints, it will be continued to the next process. If not, then the flow of the student complaint handling process is complete.	-
Consultant Staff	*Task*	Processing student complaints that have been received by consulting staff.	Problem solution data.
Consultant Staff	*Task*	Update on the process of handling student complaints.	-
Consultant Staff	*End Event*	The process flow for handling student complaints by consulting staff is complete.	-
Student	*Timer Event*	After submitting the complaint that has been submitted previously, the student waits for the complaint handling process carried out by the consultant staff.	-
Student	*Task*	Students check the status of complaints that have been handled.	-
Student	*End Event*	The process flow for handling student complaints has been completed.	-

4. Protoype Results

The last stage in this research is the prototype. This prototype process is the process of implementing the ideas that have been obtained into a prototype or product that can be tested [23]. The prototype stage is a solution to the ideate stage which is described through the application design. Researchers designed a UI / UX application for handling student complaints using Mockuplus Classic.

a. User Interface Design Concept

The design concept used in this research is usability. Usability referred to in this study is the quality of the system that is easy to learn, easy to use and encourages users to use the system as a positive tool in completing tasks. In this context, what is meant as a system is an application for handling student complaints. The user interface of this handling application uses an android layout, with the aim that when this application is implemented the application is more accessible to students by using a smartphone. This is the guideline for researchers to design the UI / UX of student complaint handling applications.

b. Information Architecture

Information architecture is used as an application design process and as an information architecture schema as a tool to simplify the application UI/UX design process. The sitemap in this study can be seen in Figure 4.
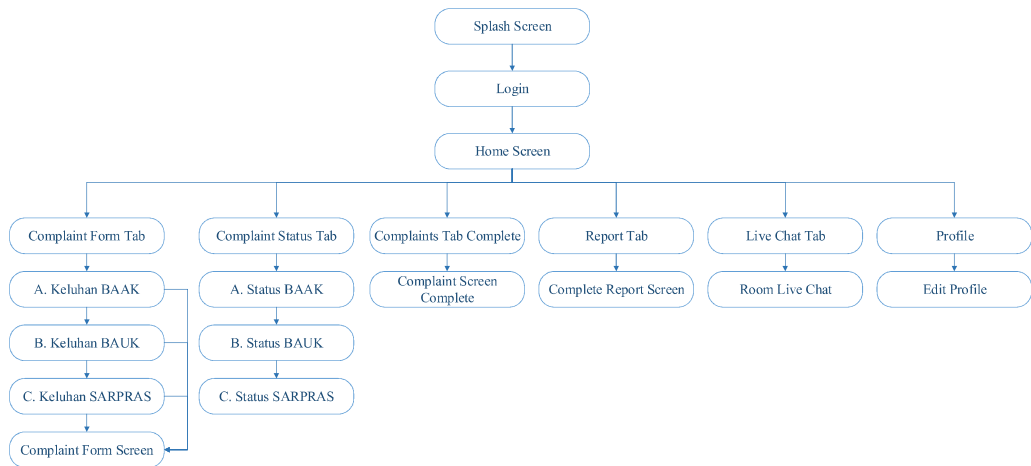
Fig 4. Student Complaint Handling Application Sitemap

c.   *Wireframe and Low Fidelity Wireframe*

Wireframe is an outline drawing of a system or application. In this research, there are two stages of wireframe, namely wireframe sketch and low fidelity wireframe.Drawing sketches serves as the initial design of an application, this sketch also serves to reduce errors when performing digital visualization on wireframes. Then, after describing the wireframe sketch, the researcher then describes the sketch into a wireframe visualization that will be used without using images and colors.
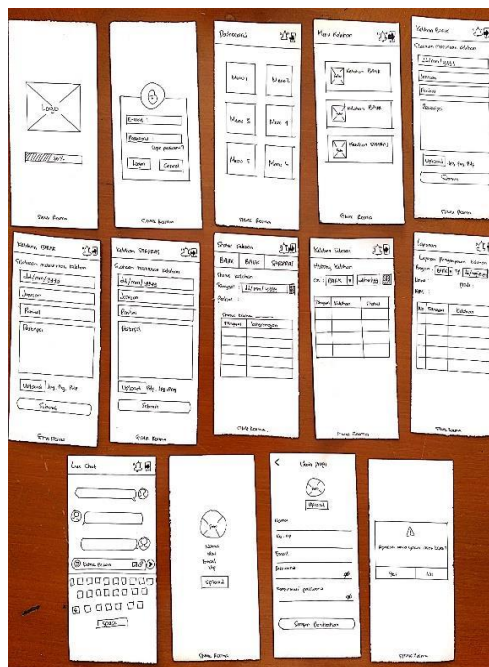
5(a)   5(b)

Fig 5. (a) Wireframe sketch, (b) Low Fidelity Wireframe

d.   Style Icon

Icons serve as visuals that make it easier for users to use a user experience application. Icons are original shapes that have been stylized, changed their shape to be simpler without leaving their original shape. The following are some of the icons used in the student complaint handling application.

Table 5. Student Complaint Handling Application Icons

No.	Icon	Description	No.	Icon	Description
1.		Student Complaint Handling Application Logo.	8.		Complaint Form icon to BAAK.
2.		Student Complaint Form Menu Icon.	9.		Complaint Form icon to BAUK.
3.		Student Complaint Status Menu Icon.	10.		Complaint Form icon to SARPRAS.
4.		Complaint Menu Icon Done.	11.		Notification icon.
5.		Report Menu icon.	12.		Warning icon.
6.		Live Chat Menu Icon.	13.		Logout icon.
7.		Profile Menu Icon.			

e.   Typography

Font is the shape, model or size of a letter in a software. The font used in the design of the student complaint handling application is Tahoma.
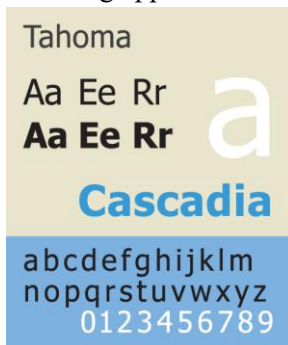
Fig 6. Typeface Tahoma
Source: Wikipedia [24]

f.   *Prototype*

After knowing the concept, sitemap, application sketch, low fidelity wireframe mockup, icons and typography used in designing the application user interface, next is the application prototype. The following is the UI/UX display in the student complaint handling application:
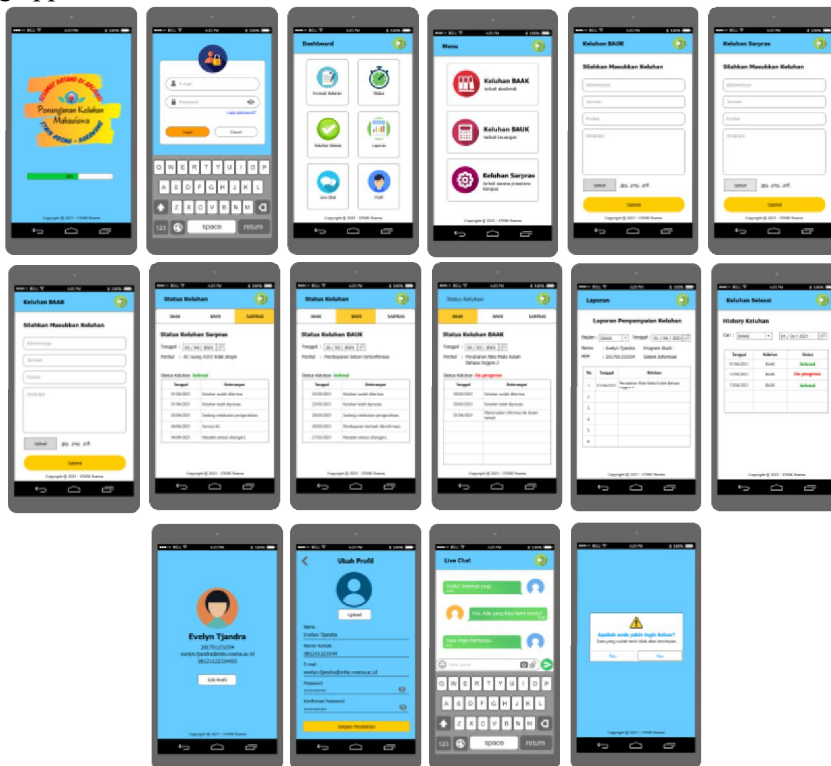

Fig 7. Student Complaint Handling Application Design

IV.   CONCLUSION

Based on the results of the analysis conducted by researchers on the process of handling student complaints at STMIK Rosma, the following conclusions can be obtained.

1. The business process currently running in the student complaint handling process is still using the manual method. Students submit their complaints verbally, namely coming to campus or conveying through social media such as whatsapp.

2. The results of the problem analysis that has been carried out based on ongoing business processes are that the student complaint handling process takes a long time, the information submitted cannot be fast, there is no status regarding the complaint handling process, the complaint data is not well documented. and the absence of clear procedures for handling student complaints.

3. The solutions provided based on existing problems are improving existing business processes and modeling the UI/UX of the complaint handling application

in order to increase the effectiveness and efficiency of the student complaint handling business process at STMIK Rosma.

4. The result of this research is the UI/UX application for handling student complaints. In the design of the application, there are 6 features, namely the complaint form feature, the complaint status check feature, the complaint history feature, the complaint information report feature that has been submitted, the live chat feature in the application and the user profile feature. With the UI/UX model of the student complaint handling application, it is hoped that it can provide input to universities to improve existing business processes to be more effective and efficient.

V. ACKNOWLEDGMENTS

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