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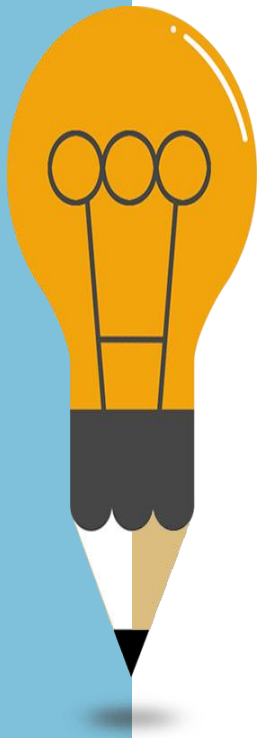
Development Of E-Learning And Statistical Simulation For Explorative Data Analysis Courses Based On Android

NIA GRACELITA | LUTFI RAHMATUTI MAGHFIROH



Agenda

01 Introduction

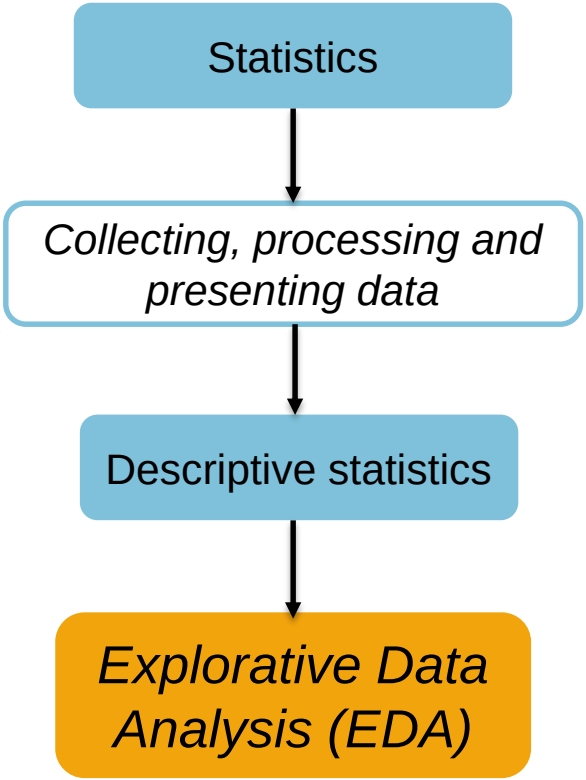
02 Methodology

03 Implementation and Result

04 Conclusion

Introduction

Introduction



What is EDA?

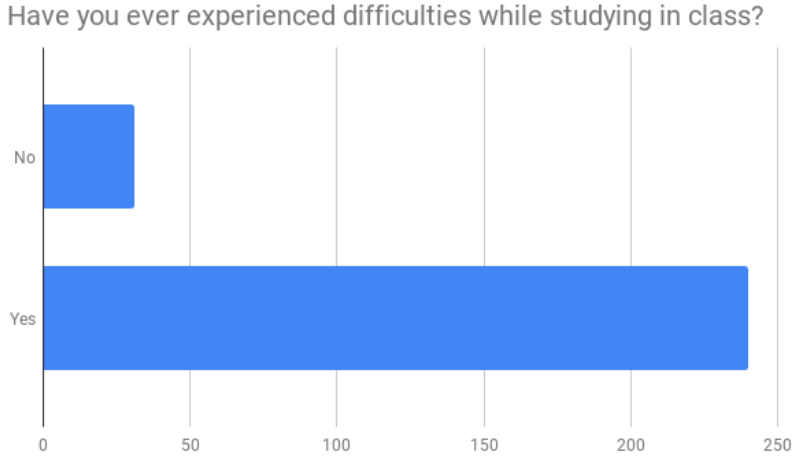
Exploratory data analysis isolates data patterns and features and expresses them firmly to analysts.
(Hoaglin, Mosteller, & Tukey, 1983)

Analysis to recognize data patterns through diagrams or graphs, detect them extreme values, determine the pattern of relationships between variables for the purpose of further analysis.

Important ???

Present statistical data visually → **Examination of data so that the determination of the model is more fit**

How are the learning activities at the Politeknik Statistika STIS?



88,6% have experienced difficulties while studying

According to Riding [2], it is natural to happen because everyone has different characteristics in learning, such a s existing knowledge, intelligence, memory efficiency, ge nder, style in analyzing, and style in imagining a thing.

Cause:

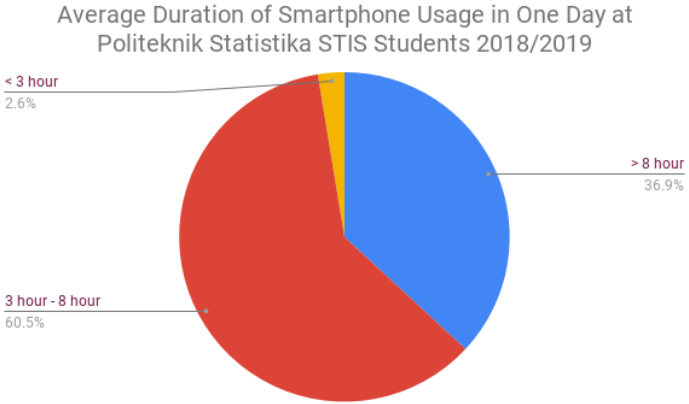
- Lack of focus when learning activities
- The lecturer is too fast in explaining
- Use of terms that are not understood
- Have not mastered the previous material so they cannot follow the material being taught

E-learning

E-learning is a set of innovative applications that are used to conduct learning using technology. (Prawiradilaga, 2013)

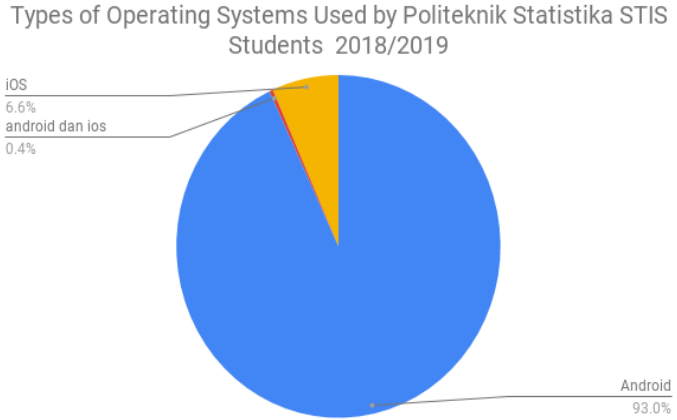
Computer simulation based learning systems can help students to build a knowledge base and reduce errors in concept recognition. (Chen, Lai 2005).

Lindgren dan Schwartz (2009) said that learning system based on comp uter simulation can not only develop spatial learning, but also the ability in the perception of students.



The use of smartphones is very common with the daily life of S TIS students.

Opportunities for the use of smartphone devices with the Android operating system as learning media are increasingly large.



Research Purposes:

1. Develop an e-learning system for android-based ADE courses.
2. Develop an e-learning system with processing features for data summaries and discussion forums that can help understanding t he material through questions and answers.

Methodology

Method of Collecting Data

Data collection to support the development of this e-learning system uses the following methods:

Literature Study

Journals, books, articles, etc. related to the development of this system, using keywords: mobile-learning, exploratory-data-analysis, and android.

Questionnaire

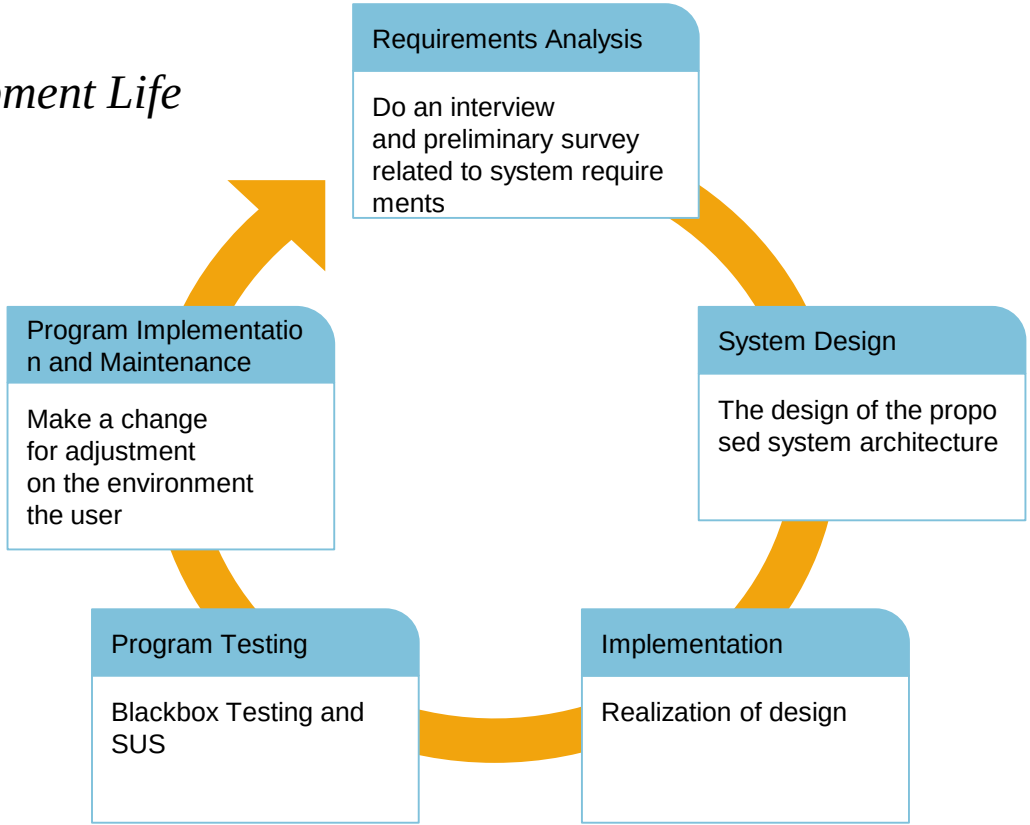
- Preliminary Survey
- SUS
- Blackbox Test

Interview

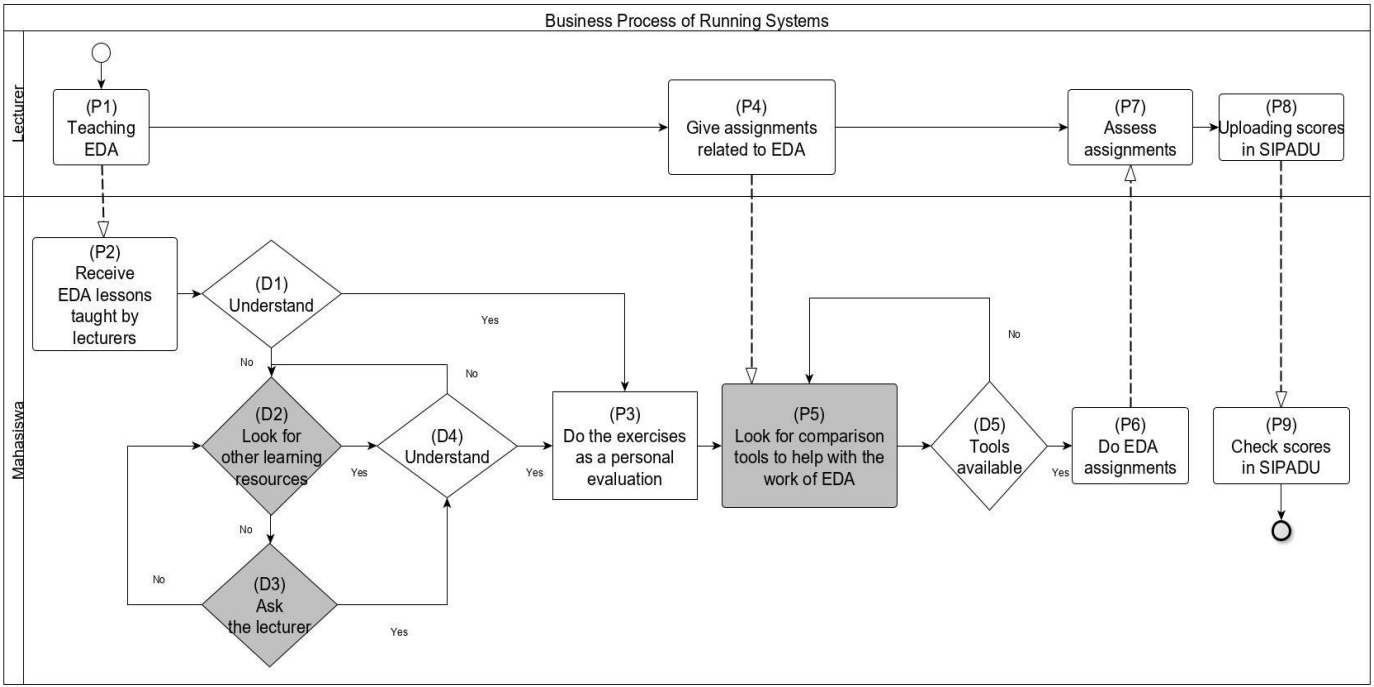
Explorative Data Analysis (EDA) lecturers and 7 students from the Politeknik Statistika STIS students in the academic year 2018/2019

System Development Methods

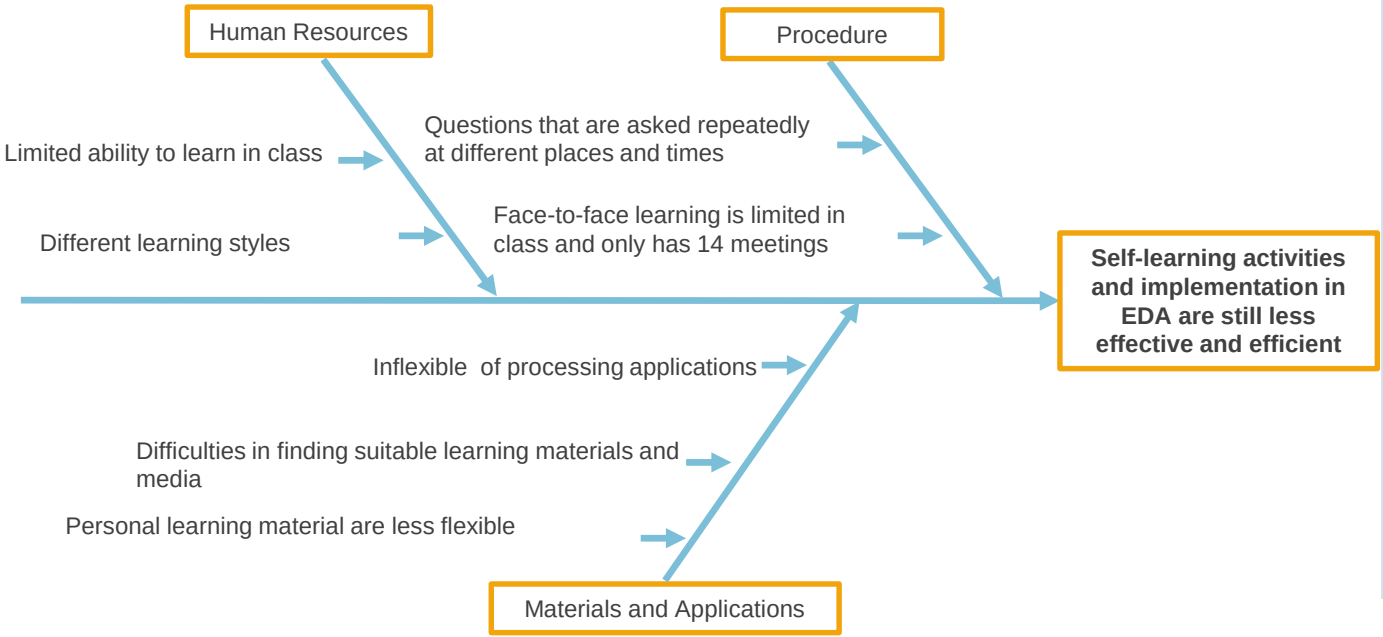
System Development Life Cycle (SDLC) : *Waterfall*



Running System



Problem Analysis



System Requirements

Performance

Creating a system that facilitates learning so that it is not limited by time and place (class).

Efficiency

Provide a system that can accommodate questions and answers that can be accessed so that there is no repetition in asking questions.

Economic

Provide a system with appropriate learning materials.

Control

Provides a system that is able to maintain the security of info rmation access in the form of asking questions and answers through account authentication.

Service

Provides applications containing teaching materials, processing applications and discussion forums on an Android-based system.

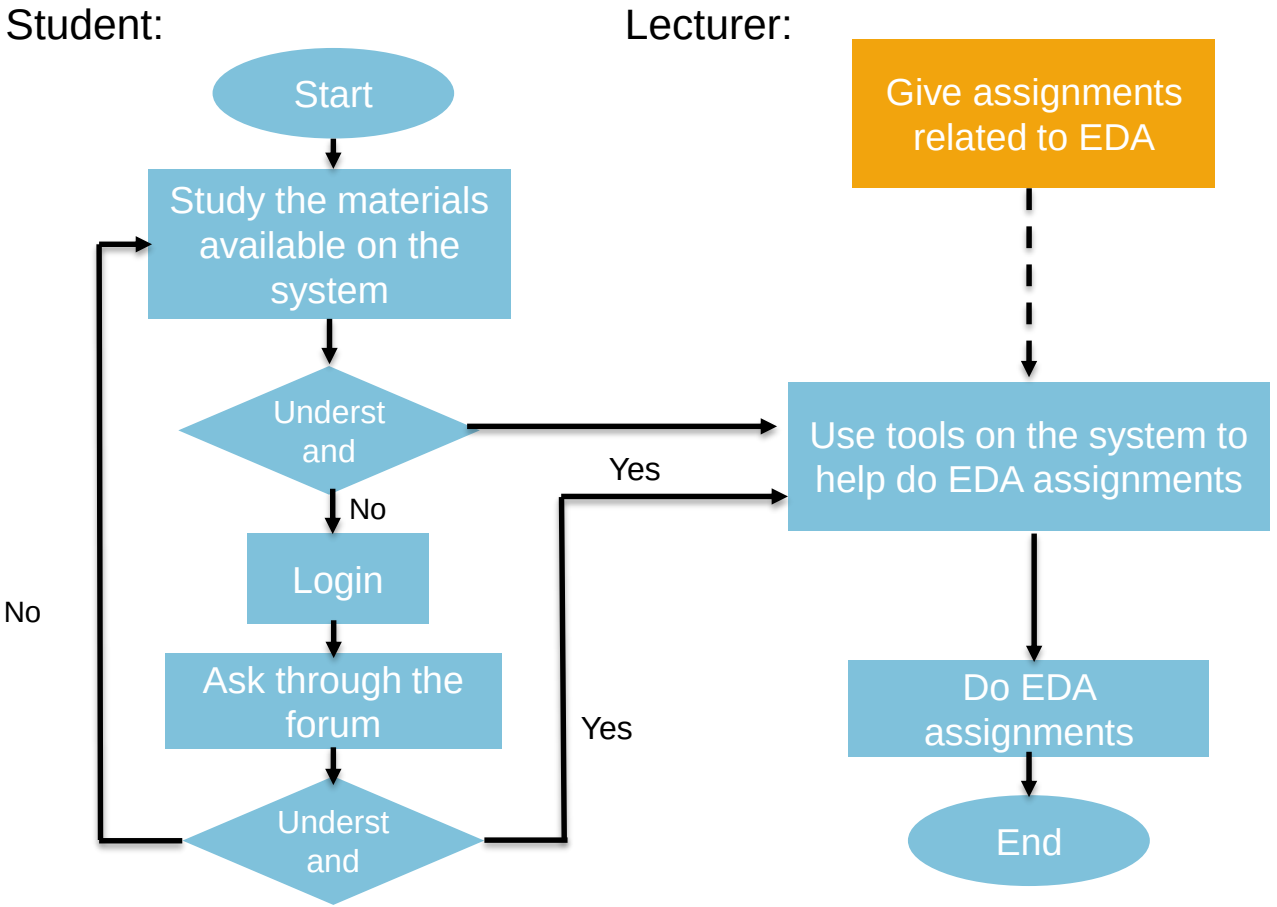
Information

Provide a system with materials that are already integrated with learning resources such as text, photos and videos.

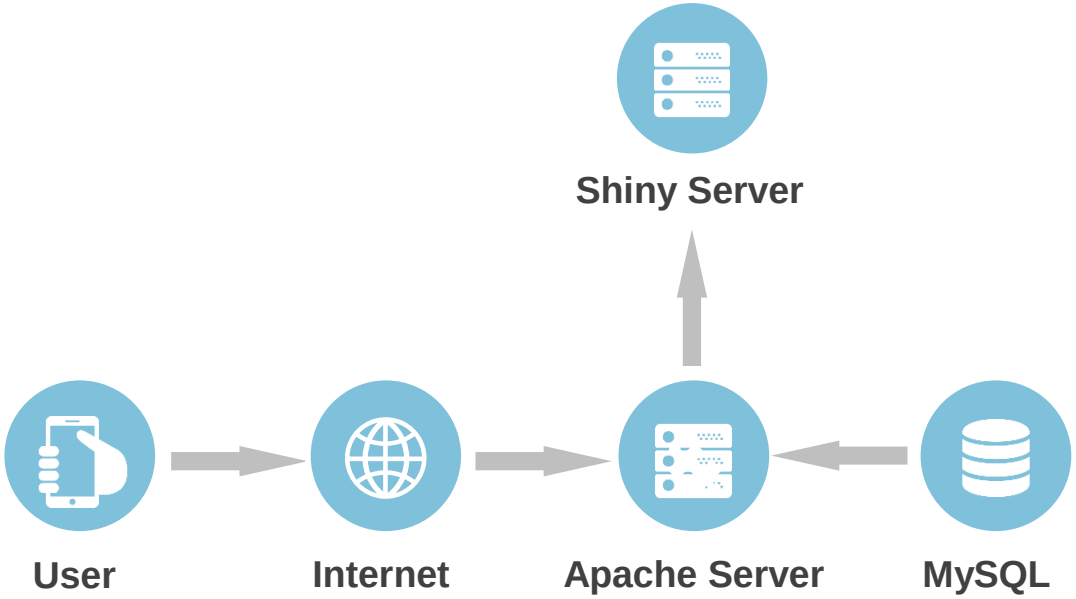
Provides processing applications on the system accompanied by steps that are able to process data

Implementation and Result

Proposed System Design



Architectural Design



Implementasi Antarmuka

System Test Result

Black Box Test Result

The functions contained in the system are running well and the desired output is appropriate.

SUS Result

The system is in the good category and can be accepted by users.

Conclusion

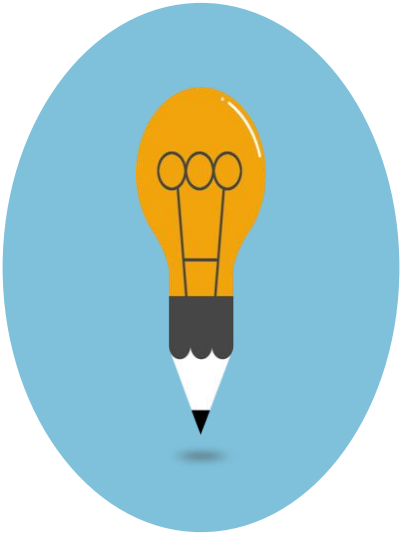
Conclusion

01 A system is developed which can be accessed as long as an internet connection is available and specifically for material can be accessed offline.

02 Admin side is developed using a responsive framework that is bootstrap which can be accessed through various devices while connected to the internet. The user side is developed using native android.

03 Processing features is develoved using RShiny.

04 Black Box Test and SUS score of 84.13 show that the system developed has been accepted by the user.



Question 1

I think that I would like to use this system frequently.

8,47

Question 2

I found the system unnecessarily complex.

8,33

Question 3

I thought the system was easy to use.

9,44

Question 4

I think that I would need the support of a technical person to be able to use this system.

8,47

Question 5

I found the various functions in this system were well integrated.

8,61

Question 6

I thought there was too much inconsistency in this system.

7,50

Question 7

I would imagine that most people would l earn to use this system very quickly.

8,61

Question 8

I found the system very cumbersome to use.

8,75

Question 9

I felt very confident using the system.

8,75

Question 10

I needed to learn a lot of things before I could get going with this system.

6,94

Use Case Diagram

Advantages using Waterfall Methods

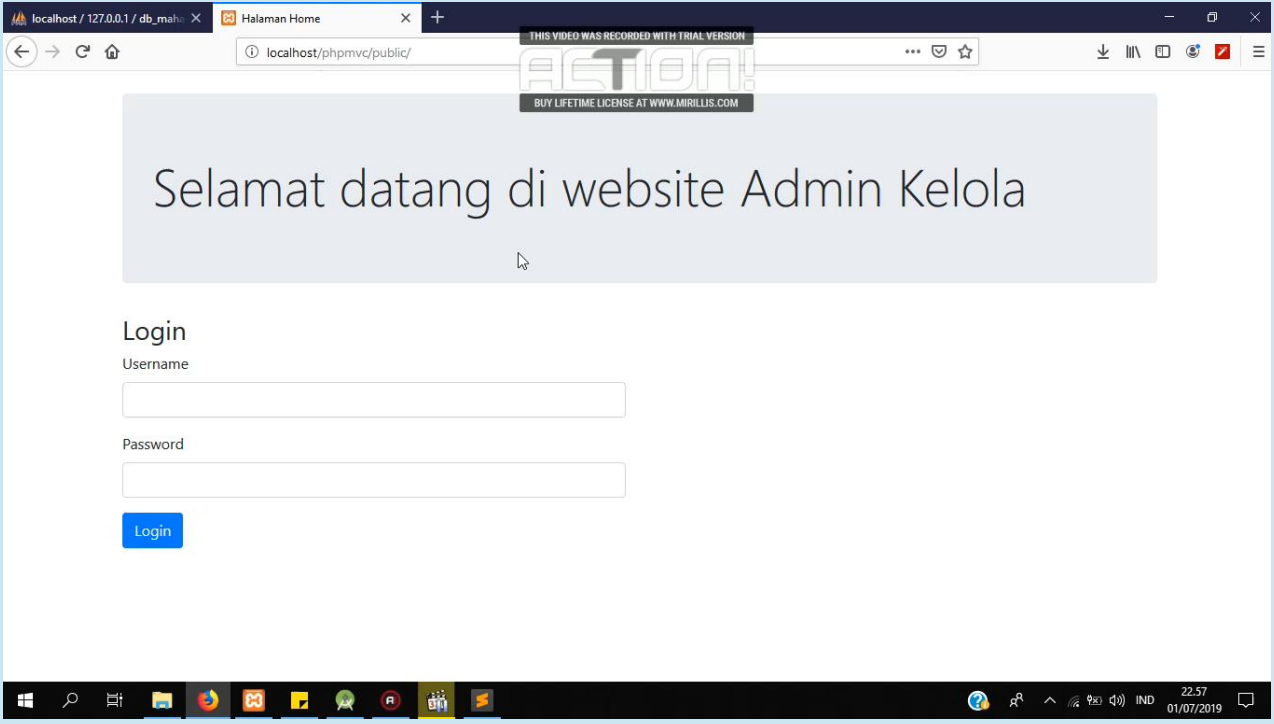
01 The most reliable and longest-used development model.

02 The execution of the system project will be well scheduled and easily controlled.

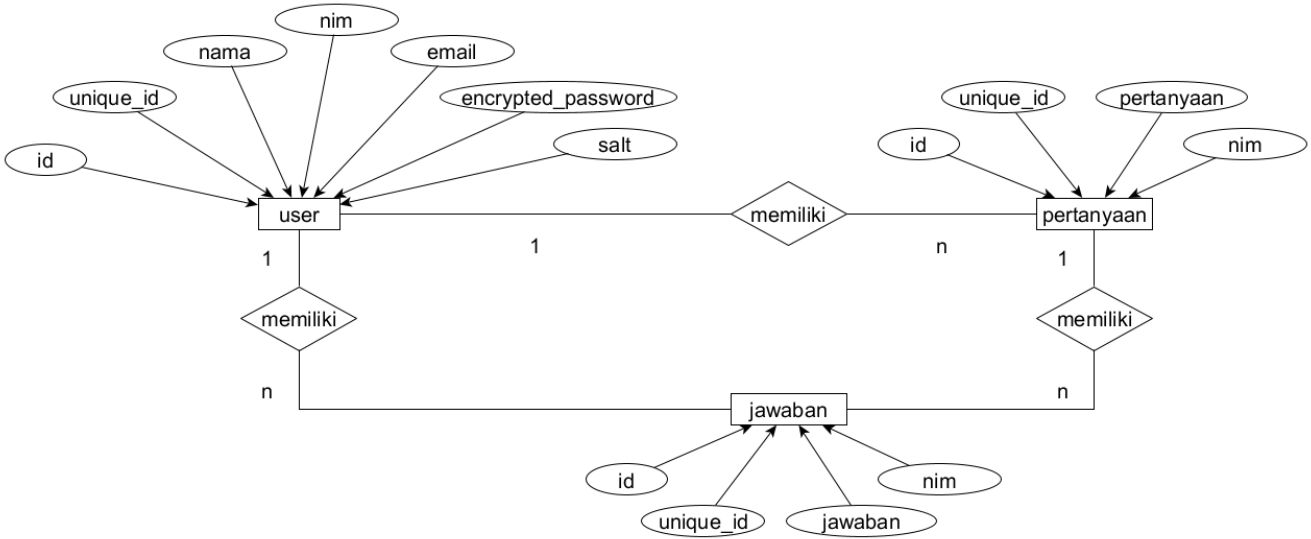
03 The quality of the system that is granted will be good because the implementation is gradual so it is not focused on certain stages.

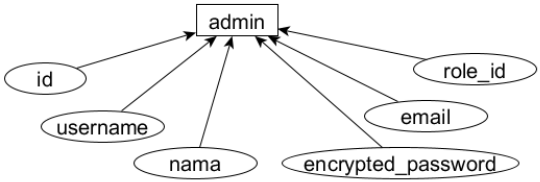
04 Organized system development documents.

Admin Web Implementation

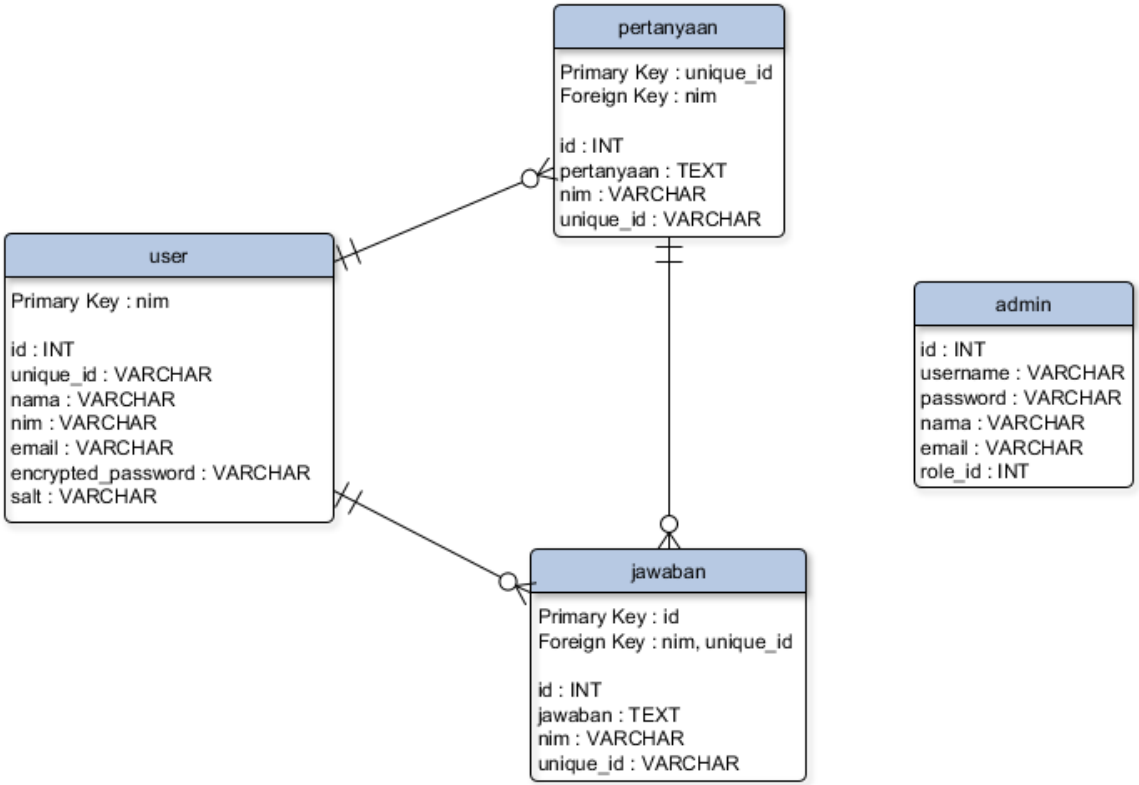


Database Design





Database Design



Database Implementation

```
--
-- Database: `db_mahasiswa`
--

-- --------------------------------------------------------

--
-- Table structure for table `tbl_jawaban`
--

CREATE TABLE `tbl_jawaban` (
  `id` int(11) NOT NULL,
  `unique_id` varchar(30) NOT NULL,
  `jawaban` varchar(300) NOT NULL,
  `nim` varchar(30) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=latin1;

-- --------------------------------------------------------
```

```
--
-- Table structure for table `tbl_pertanyaan`
--

CREATE TABLE `tbl_pertanyaan` (
  `id` int(11) NOT NULL,
  `pertanyaan` varchar(300) NOT NULL,
  `nim` varchar(15) NOT NULL,
  `unique_id` varchar(23) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=latin1;

-- --------------------------------------------------------

--
-- Table structure for table `tbl_user`
--

CREATE TABLE `tbl_user` (
  `id` int(11) NOT NULL,
  `unique_id` varchar(23) NOT NULL,
  `nama` varchar(50) NOT NULL,
  `nim` varchar(15) NOT NULL,
  `email` varchar(100) NOT NULL,
  `encrypted_password` varchar(80) NOT NULL,
  `salt` varchar(10) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

Black Box Testing Scenario

No	Scenario	Expected Results	Actual Results
1	Access EDA material	Showing results in the form of a list of ADE material	Success
2	Access the discussion forum	Display the ask questions page and list of questions	Success
3	Access data processing tools	Displays the data processing page	Success
4	Perform data import activities	Import CSS format data from device smartphone	Success
5	Perform data processing activities	Processing data that has been imported with the methods and variables needed	Success
6	Access user management	Displays a page for managing users	Success
7	Perform user data update activities	Updating user data that has been saved	Success
8	Perform activities to create a new user	Create and save new user data	Success
9	Perform delete user activities	Delete user data that has been saved	Success
10	Access manage discussion forums	Display the page for managing the discussion forum	Success
11	Undertake delete questions	Delete the selected question	Success
12	Perform delete answer activities	Delete the selected answer	Success
13	Perform login activities	Displays the login page and directs to a new page	Success
14	Conduct material updating activ	Updating material that has been saved	Success