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Research paper

Development of the Indonesian Teacher Engagement Index (ITEI) Apps Model without the Internet

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Abstract

The internet network is a resource not always available in some remote areas. It makes them have difficulty in accessing information online. As a result, technological developments in the region are also obstructed. This study attempts to extend the technical approach to improve the utilization of ITEI as a self-diagnostic application that can be accessed offline through a web browser. So teachers who live in remote areas can still learn their profile engagement. With the help of the proposed platform, app developers can easily develop and publish offline Web applications with Web content and simplified external sync capabilities.

Keywords: *ITEI Apps, Indonesian Teacher Engagement Index.*

1. Introduction

The Internet today is a necessity that is important enough for everyone because it is able to accommodate various needs through developed features [1]. The development of the Internet also allows each user to access easily because it is integrated with a communication tool that is mobile. Indonesia began to recognize the internet since the early 1980s when internet connection started by University of Indonesia [2]. But until now the development of the internet still cannot be felt evenly by all the people of Indonesia because of the problems of various Indonesian conditions [3], [4].

By looking at technological developments that have been adopted by various fields, was able to provide new opportunities to create various innovations, especially in the field of education. The Internet has enabled the creation of new learning that can improve the quality of education relevant to current needs [5].

One of the new breakthroughs being developed is the ITEI (Indonesian Teacher Engagement Index) application, an Android-based application that can be used by teachers to self-diagnostic the conditions of engagement within themselves [6, 7, 8]. Teachers become the focus of this application development because teachers have a role in determining the quality of education and education reform agenda that occur in various developing countries aims to overcome the teacher quality disparity so that teachers can more effective in carrying out duties and obligations [9, 10].

Considering the plurality of Indonesians and unequal technological access, this study attempts to explore a technical approach to improve the utilization of ITEI as a self-diagnostic application that can be accessed offline through a web browser. So, teachers who live in remote areas can still learn their profile engagement. With the help of the proposed platform, app developers can easily develop and publish offline Web applications with Web content and simplified external sync capabilities.

2. System Planning

2.1. Identification of System Requirements

The facilities and infrastructure needed for the implementation of Teacher's profiling are as follows [11]:

- Local server
- The client computer

The minimum hardware specifications of the local server that should be provided for the ITEI application are as follows:

- PC / Tower / Desktop (not laptop).
- Processor with 4 cores and clock frequency 1.6 GHz 64 Bit.
- 8 GB RAM (With 4 GB RAM VM).
- 250 GB hard drive.
- Operating System (64 bit): Windows Server / Windows 8 / Windows 7 / Linux Ubuntu 14.04. LAN CARD two units (one to the internet network and one to the local Network).
- The specification above for 1: 40 ratio (1 server maximum for 40 clients) Increasing the number of ratios must increase the number of cores and RAM.

The minimum hardware specifications of participant computers that should be provided for the ITEI application are as follows:

- PC, Laptop, Thin / Zero Client / N-Computing / NUC, Rasberry, Chrome book
- Monitor 12 inch minimum
- Single core processor with 400 MHz clock frequency

- At least 512 MB of RAM
- Operating System: Windows / Linux Ubuntu 14.04 / MAC OS / Chrome OS
- Minimum available hard drive 10 GB (free space)
- LAN Card
- Number of clients follow 1: 3 ratio (1 client for 3 participants)
- minimum reserve of 10%.

Network hardware specifications that should be provided for ITEI applications are as follows:

- Cable: at least CAT5E 10/100/1000
- Switch: switch with a minimum port number of 24 ports with 10/100/1000 transfer rate. Bandwidth: 1 Mbps dedicated
- IP: DHCP (for internet network IP)
- Static (for local network IP)

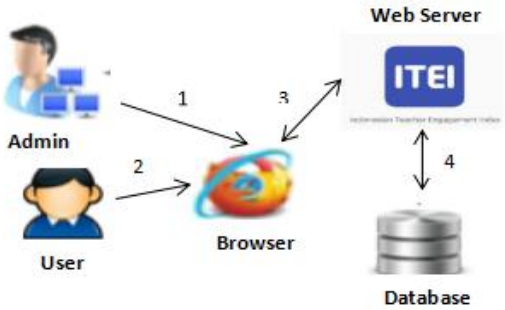
2.2. Software Specification

Here are some software specifications used in system development [12]:

- Macromedia Dreamweaver and Notepad ++ as a tooleditor
- JDK 1.6.0
- MySQL database engine.
- Web browser Mozilla Firefox and Internet Explorer
- Apache Tomcat 6.0 Web server

2.3. Designing Software

2.3.1. Application Conceptual Framework



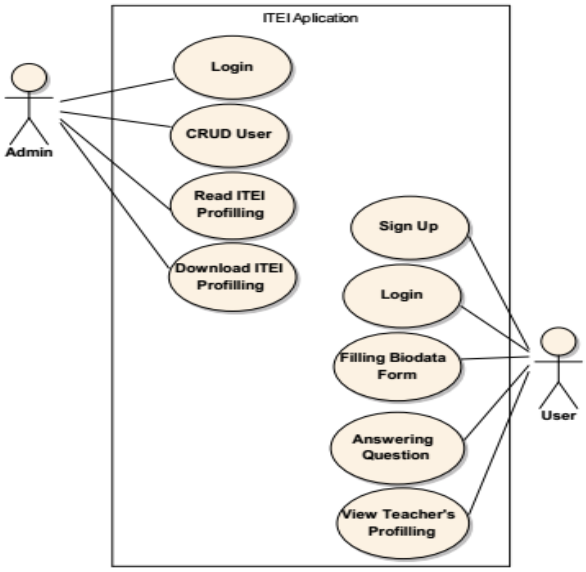
Picture 1: The Conceptual Framework of Web-Based ITEI Applications

In the conceptual framework of web-based ITEI applications that will be created, there are two types of users (users) and have different access rights.
Users include admin, user (teacher) access the application via browser, then log in. Each registered user can access different functions based on the user's permissions. Admin (1) can CRUD the user and see the results from Teacher's profiling. Admins can also download reports from teacher's profilling.
The web browser displays the pages of each user and documents stored in the web server then returns the results of the user request. In addition answering question process is also done within the web browser.
The application then processes the request from the user in the database and the database provides the requested information.

2.3.2. UML

Unified Modeling Language (UML) is a language or tool for visualizing, creating and documenting the results of analysis and design. Some UML diagrams used in this study, ie [13]:

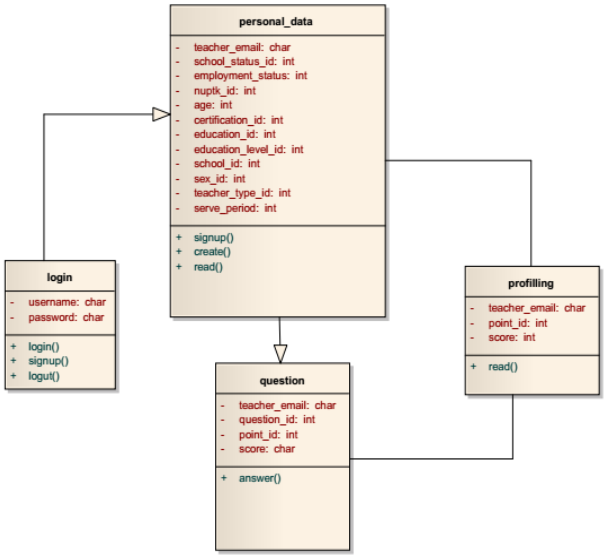
a) Use Case Diagram, Use case diagrams describe the ongoing functions viewed from the user side. The use case is a written scenario of a business process. In the design made, there are only 2 (two) actors. These actors can be humans that interact with the system. Based on the requirements mentioned above, the use case diagram that explains the relationship between case and actor is as follows [14]



Picture 2: Use Case Diagram ITEI Aplication

Actor: Admin
Use case: After login, admin can CRUD (Create, Read, Update, Delete) User, see ITEI Profiling result and download recap result from ITEI Profiling.
Actor: User
Use case: After user registration and complete teacher data, the user can log in and then Answering Question and also see result from treacher's profiling.

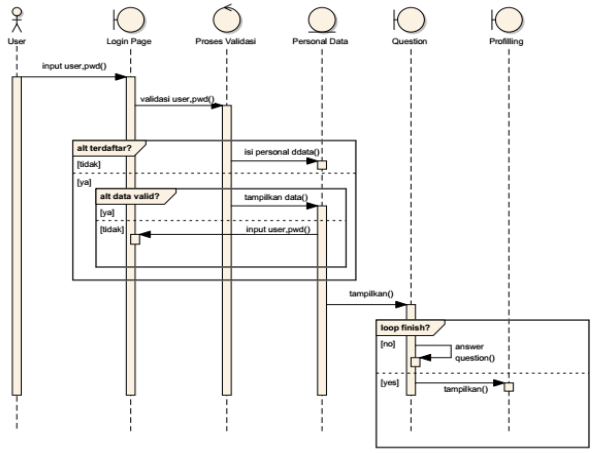
b) Class Diagram



Picture 3: Use Class of ITEI Application

Class Diagram is shown in the picture above there is 4 class which each class has variable so that can fulfill the requirement of an application to be built.

c) Sequence Diagram



Picture 4: Sequence Diagram ITEI Aplication

Based on Sequence Diagram image there is

- Life Line, interacting interfaces include: login page, form personal data, form question, form profiling.
- 1 actor: User (Teacher)
- 7 Messages, specifications of communication between objects containing information about the activities of the actor are common, including user password input, user password validation, personal data content, show personal data, display question form, answer the question, show teacher's profiling .

3. Discussion

ITEI without internet becomes one of the new development model that is done so that teachers scattered all over the country do not experience obstacles to improve their quality although constrained equity access technology. The basic concept of ITEI is for teachers to be more engage with their professions [6, 15].

The development of ITEI application is so that teachers can regularly conduct assessment to see their own engagement profile so that they can independently perform programs that can improve various aspects that shape engagement such as having positive psychological condition, able to build positive education culture, have high performance, have national character, have nationalism leadership engagement and have competence as educator [16, 17, 18, 19, 20].

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