

Design And Development Of An E-Certificate Application To Improve Certificate Distribution Efficiency At Global Skill Mandiri Medan Work Training Institute

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Abstract: One of the biggest issues facing the administrative administration of vocational training facilities is the effective distribution of certificates. Certificates are distributed manually, which is time-consuming, expensive, and prone to administrative errors. The goal of this study is to create and implement an E-Certificate application that will increase the Global Skill Mandiri Medan Vocational Training Institute's certificate distribution efficiency. This application lessens dependency on manual procedures by enabling training participants to download certificates on their own via a web-based platform. Research and development (R&D) is the research methodology employed. The E-Certificate program, which is the outcome of this study, can be utilized by organizations to automatically issue and distribute certificates to participants and give them simple access to download the

INTRODUCTION

Vocational training institutions play a very important role in enhancing the competencies and skills of the workforce in various industrial sectors. One form of recognition for participants' success in following the training program is the issuance of certificates. This certificate serves as valid proof that the participant has completed a specific training and meets the qualifications set by the training institution. However, the distribution of certificates in physical form often leads to various obstacles, such as shipping costs, delays, and administrative issues related to recording and verification. Moreover, the management of certificate data that is still manual-based requires a lot of time and resources, which can reduce the operational efficiency of training institutions. These obstacles not only hinder the smooth distribution of certificates but can also reduce participant satisfaction.

In the current advancement of technology, the existence of certificates is not only in the form of printed physical copies but also in the form of documents that can be

accessed anytime and anywhere online. Each issued certificate must also be verifiable for its authenticity so that it cannot be forged. In this E-Certificate system, it is equipped with a QR-Code as a media system to verify the issued certificates. The created QR-Code generates a URL link that will direct to the event organizer's website page. With the presence of the QR Code, it can facilitate interested parties in verifying the issuance by the Global Skill Mandiri Work Training Institute.

RESEARCH METHODS

Research Stages

This research uses the Research and Development (R&D) method aimed at designing, developing, and testing the E-Certificate application as a solution to improve the efficiency of certificate distribution in vocational training institutions. The R&D method was chosen because it is suitable for research focused on product or system development. The stages in this research consist of several phases, which include needs analysis, system design, application development, implementation, and evaluation. Here are the stages of the research conducted,

1. System Requirements Analysis

This stage aims to identify the specific needs that must be met by the E-Certificate application, based on the issues present at Global Skill Mandiri Medan. Needs analysis is conducted in the following way::

- a. Interview: Conducting interviews with the training institution's administrators to uncover the issues faced in the distribution of certificates.
- b. Observation: Observing the ongoing certificate distribution process at the training institution to gain a clearer picture of the challenges faced.
- c. Participant Survey: Distributing surveys to training participants to gather feedback on their experiences in receiving certificates and the need for an efficient E-Certificate system.

2. System Design

After analyzing the requirements, the next step is to design the E-Certificate system. This design phase includes::

- a. User Interface (UI/UX) Design: Designing a user-friendly application interface, so that training participants can easily access and download their certificates

independently.

- b. System Architecture: Designing a web-based application architecture that can manage certificate data securely and efficiently, and provide an adequate user authentication system in the form of a QR-Code as a verification system to check the authenticity of ownership of electronic certificates to reduce the presence of fake certificates.

3. Application Development

At the development stage, the E-Certificate application is built based on the design that has been created.

- a. The website page is created using the standard language, which is HTML. This HTML script will be translated by the web browser so that it can be displayed in a form of information that can be read by everyone. The programming language used is PHP with a MySQL database and the CodeIgniter framework.
- b. Feature Integration Integrating various features, such as user authentication, certificate storage, and a certificate download system.
- c. System Testing, testing the application to ensure all features work well and the application can run on various devices used by participants..

4. System Implementation

After the application has been developed, the next stage is the implementation of the application at Global Skill Mandiri Medan. The implementation is carried out with the following steps::

- a. Manager Training, this stage provides training to training institution managers on how to use the application to manage and distribute certificates digitally.
- b. Application Implementation, the application begins to be used to distribute certificates to training participants after they complete the training program.

5. System Evaluation

After implementation, an evaluation is conducted to assess the performance and effectiveness of the E-Certificate application in improving the efficiency of certificate distribution..

Method

In conducting a research, a research method or a description of the activities carried out to achieve the results of the research is always needed. In this research, the method used in system design is the Agile development method. In Agile, techniques that enable the rapid and responsive creation of software. This Agile approach is based on incremental and iterative development. Extreme Programming (XP) is one example of a development methodology within Agile for information system development.

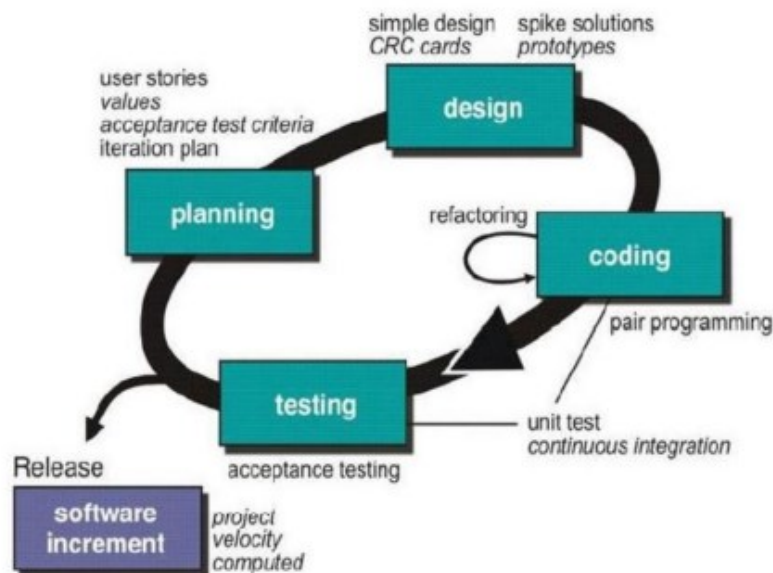


Figure 1 . Agile Method

The Agile stages as shown in the picture above are explained as follows:

a. Planning

At this stage, the author creates a system plan that will be developed in coordination with the system users to obtain everything needed by the system.

c. Design (design)

After obtaining the system requirements, the author then creates a system design according to those requirements.

c. Code Line Creation (coding)

The next stage involves programming coding, where the author uses the PHP programming language with the CodeIgniter framework.

d. Testing

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After the system is finished coding, the next step is to conduct testing on the system.

e. Implementation (Release Software Increment)

The final stage of this research is to release the system to the users, in this case, the institution where the system will be used.

RESULTS AND DISCUSSION

From the system design, the results achieved in this research are a training registration information website and a system dashboard that will later be used by agency operators to approve training participants' certificates.

a. Website Main Page



Picture 2. Main Page

b. Training Registration Page



Picture 3. Training Registration Page

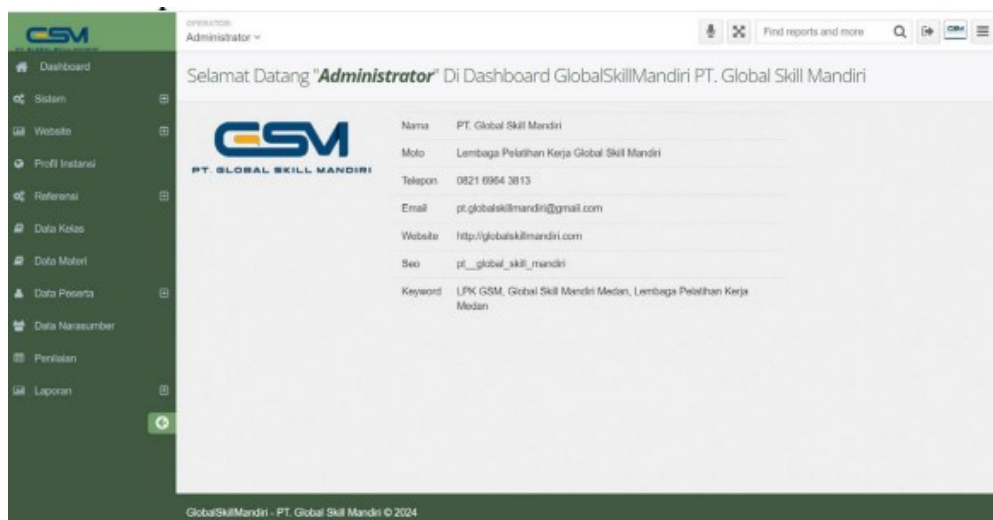
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c. Certificate Download page



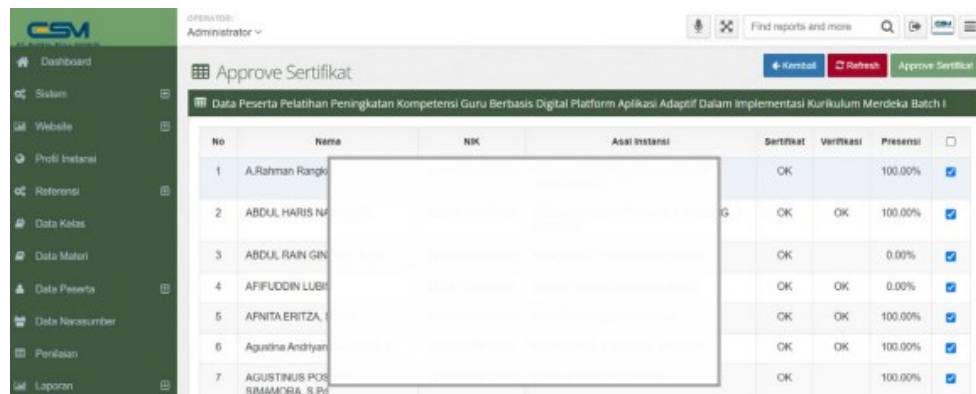
Picture 4. Certificate Download page

d. Operator Dashboard Page



Picture 5. Operator Dashboard Page

e. Certificate Approval Page



Picture 6. Certificate Approval Page

CONCLUSION

- a. From the discussion of the research that has been conducted, there are several conclusions that can be drawn, namely:
- b. a. The Global Skill Mandiri Work Training Institution has a website that includes the institution's profile, a list of available training programs, and information about the institution.
- c. b. The institution's operator can approve certificates according to the participants who attended.
- d. Participants can download certificates from the website page.

REFERENCE

- B. R. F. Agariadne Dwinggo Samala, "RANCANG BANGUN APLIKASI ESERTIFIKAT BERBASIS WEB MENGGUNAKAN METODE PENGEMBANGAN WATERFALL," *Jurnal Teknik Informatika*, vol. 13, no. 2, pp. 147-156, 2020..
- D. A. F. E. E. Ramdhan Saepul Rohman, "RANCANG BANGUN APLIKASI ESERTIFIKAT BERBASIS WEB MENGGUNAKAN METODE USER CENTERED DESIGN," *JURNAL RESPONSIF*, vol. 4, no. 1, pp. 1-11, 2022.
- M. H. N. D. N. Noviandri, "PERANCANGAN E-SERTIFIKAT MENGGUNAKAN GRAVITY FORM PADA WEBSITE OFFICIAL EVENT UNIVERSITAS SIBER ASIA," *JIPI (Jurnal Ilmiah Penelitian dan Pembelajaran Informatika)*, vol. 8, no. 4, pp. 1493-1500, 2023.
- T. H. S. M. E. Muhammad Ridwan, "PENERAPAN FRAMEWORK CODEIGNITER DALAM PERANCANGAN APLIKASI MANAJEMEN IURAN PERUMAHAN GRIYA MANDIRI," *Djtechno: Journal of Information Technology Research*, vol. 3, no. 1, pp. 50-58, 2022
- Y. D. P. M. R. Yuli Syafitri, "PEMANFAATAN FRAMEWORK CODEIGNITER UNTUK MEMBANGUN APLIKASI DISPLAY PRODUK DI ALFAMART RAJABASA," *JURNAL INFORMASI DAN KOMPUTER*, vol. 9, no. 1, pp. 45-52, 2021
- H. B. H. H. Eva Rahmawati, "Rancang Bangun Sistem Pendaftaran Webinar dan ECertificate Otomatis," *Jurnal Teknik Informatika Unika ST. Thomas (JTIUST)*,

Proceedings The 2nd Annual Dharmawangsa International Conference:
“Digital Technology And Environmental Awareness In Promoting Sustainable Behavior
In Society 5.0”

vol. 09, no. 01, pp. 32-42, 2024.

- M. M. K. Yus Sholva, "Sistem Pembangkitan E-Sertifikat Otomatis berbasis Qr Code untuk Verifikasi E-Sertifikat secara Online," JEPIN (Jurnal Edukasi dan Penelitian Informatika), vol. 8, no. 2, pp. 337-347, 2022.
- E. A. Joseph Dedy Irawan, "PEMANFAATAN QR-CODE SEGABAI MEDIA PROMOSI TOKO," Jurnal MNEMONIC, vol. 1, no. 2, pp. 56-61, 2018.
- A. P. R. S. T. T. A. N. Chairane, "MANFAAT PENGGUNAAN DATABASE DALAM PENINGKATAN LAYANAN PERPUSTAKAAN UIN SUMATERA UTARA," JURNAL ILMIAH SAINS TEKNOLOGI DAN INFORMASI, vol. 1, no. 3, pp. 14-19, 2023.
- P. S. A. R. A. V. S. Suheri, "Penggunaan Framework Codeigniter Dalam Pembuatan Web Profil Programstudi Teknik Elektro Universitas Pembangunan Panca Budi Medan," Jurnal Nasional Teknologi Komputer, vol. 3, no. 3, pp. 227-234, 2023.
- K. U. L. N. Afif Priyambodo, "IMPLEMENTASI QR CODE BERBASIS ANDROID PADA SISTEM PRESENSI," Jurnal Teknologi Informasi dan Ilmu Komputer (JTIK), vol. 7, no. 5, pp. 1011-1020, 2020.