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Verification Of Independent Study Assessment Using Blockchain Technology

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Abstract

Current technological developments greatly impact the assessment verification system. To find out the student benchmarks in the results of teaching and learning activities during the learning system assessment process is very important in the scope of higher education. With the existence of blockchain technology widely applied in the world of Education, having the advantage of a decentralized system and strong cryptography can help universities in building infrastructure. Universitas Raharja is one of the educational institutions that has implemented an online assessment system (PEN +), which will use blockchain technology to verify the assessment of independent studies. which provides services to Raharja University lecturers in verifying student grades that can be accessed anywhere and at any time. However, currently the verification process for the independent study assessment that has been carried out is still done manually which results in verification not with very strong security. The existence of an independent study assessment verification uses blockchain technology to produce strong data security that did not occur before. In the PEN + lecturer assessment system for the independent study assessment verification process, it cannot yet enter the value of Independent study (IS) in real time. Therefore, there is a need for development in this blockchain technology for the verification process of independent study assessment. In this study there were 10 (ten) literary studies on verification of valuation. Thus there are several benefits that lecturers need not hesitate to verify the assessment, the process by using blockchain technology produces very strong security

Keywords*: Blockchain, Independent Study, Verification Of Grades*

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1. Introduction

The development of information and communication technology has greatly encouraged various educational institutions to obtain concepts in the field of assistance to improve their usefulness [1]. The rapid growth of information technology and computers enables the development of computer-based academic systems that facilitate the process of storing, organizing, and processing various data [2]. One of them is the assessment system at Raharja University for the Independent Study [IS] verification process [3]. As in the current era, competition is one of the keys to success in every college that is always required to be able to compete broadly and globally. However, universities must be able to provide and present efficient and fast services to students [4].

In its implementation it must also be equipped with several facilities to support the level of success of program objectives and services provided effectively [5]. Using blockchain technology can make the assessment system for the verification process of Independent Study (IS) assessment better [6]. This assessment system includes a very important part in the teaching and learning process activities that students undertake [7]. Assessment of student benchmarks in measuring abilities during the process of teaching and learning activities and information needed by students within the scope of tertiary institutions [8].

In an effective assessment process at Raharja University not only applies a standardized system method, but will also use the process of verifying the Independent Study assessment using blockchain technology [9]. In addition, Raharja University always strives to meet the need for information systems that can improve the process of academic performance [10]. The process of evaluating and verifying the Independent Study (IS) assessment at Raharja University is still done manually and has not been

computerized. It is very ineffective and inefficient and does not produce strong data security because it will spend time and money just to come to campus. Such a process must be carried out in an easier and more practical way if there is a system for verifying the assessment of independent studies using blockchain technology and conveying information online. In the process of sending good and effective information is determined by the system and model used [11].

For the sake of assessment, modern methods must be applied to change those that are not effective, so that there is a medium to enter grades and convey information to students quickly and accurately [12]. There needs to be a system update where lecturers can enter online grades through the website, to facilitate and efficiently access lecturers anywhere and anytime. Through the improvement of the conventional assessment process system will be transformed into online so that the verification of the Independent Study assessment at Raharja University can be done easily by lecturers [13].

2. Research Method

The process of research stages can be seen in (Figure 1).

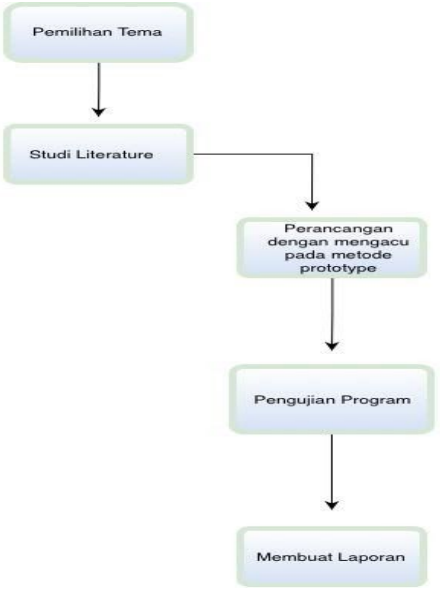

Figure 1. Stages of research

Description : For point number 1 to determine the problem, then select the theme to be taken, namely input verification Independent Study assessment. In point number 2, literary studies is used to find references in the PEN+ system. At point number 3 which uses blockchain technology that can be adapted to problems and programs. In point number 4 which is program testing, this stage is carried of the program that has been made. At point number 5 make a report in the form of an online document.

2.1 Literature Review

Here are 10 (ten) Review literature used in this study :

1. Research conducted by Untung Rahardja, Nikita Jova Dejo Suwito, Fernanda Setyobudi Armansyah in 2017 with the title "Application design PEN + Mobile based to facilitate the performance of lecturers at higher education". This research discusses the design of online assessment based mobile applications that can be accessed in a smartphone to be able to input the value by lecturers [14].
2. Research conducted by Qurotul Aini, Untung Rahardja, Anoesyirwan Moeins, the goddess Mariana Apriani in 2018 with the title "Application of Gamification in Information systems assessment of student exams to improve lecturer performance". This research discusses the application of gamification to improve the performance of lecturers in conducting student value input on time so that lecturers get appreciation so that students can see the value quickly [15].

3. Research conducted by Diah Aryani, Qurotul Aini, Fernanda Setyobudi Armansyah in 2017 titled "Designing Android Package Mobile Web on a higher Education assessment system". This research discusses the Android package-based assessment system to make it more accessible to lecturers through a smartphone [16].
4. Research conducted by Anoesyirwan, Sudaryono, Alfiah Khoirunisa in 2018 under the title "Utilization of Management of Writing Scientific in the Learning Process in Higher Education". This research discusses the management of scientific work writing needed in the preparation of scientific papers to create good works by following the development of the industrial ERA 4.0 [17].
5. Research conducted by Untung Rahardja, Qurotul Aini, Vivid Christian Alfad Zebua year 2019 under the title "Implementation of student checking system of the YII-based school Framework for higher education". This research discusses how the system can determine which students can be sure to follow the CTF conducted by the head of Department [18].
6. Research conducted by Untung Rahardja, Qurotul Aini, Nuke Puji Lestari Santoso in 2018 under the title "Integrating YII-based Framework APIS into attendance assessment systems". Research discusses the utilization of Google + in the student Attendance assessment system so that there is a profile that makes it easy for lecturers to be informed about student guidance [19].
7. Research conducted by Untung Rahardja, Qurotul Aini, Hani Dewi Ariessanti, Alfiah Khoirunisa year 2018 with the title "Effect of gamification on ILEARNING EDUCATION) in improving student motivation learning". This study discusses modern learning methods such as the gamification applied to an iLearning Education that is assessed to increase the motivation of students in implementing the learning process in the classroom [20].
8. The research was done by Untung Rahardja, Eka Purnama Harahap, Dwi Anjani in 2018 with the title "Utilization of Rinfogroup as a Media discussion and active student Assessment". This research discusses the utilization of Rinfogroup as a media discussion between lecturers and students by utilizing rinfo email in terms of online learning outside of lecture hours, as well as lecturers can explain the material and can monitor the active Student [21].
9. The research was conducted by Qurotul Aini, Untung Rahardja, Anoesyirwan Moeins, Ayu Martha Wardhani in 2018 under the heading "Application of Market Query Data (DMQ) in the YII Framework-based assessment system". This research discusses the utilization of Market Query Data so that when many users access a website does not experience slowness, because it only reads last update only [22].
10. Research conducted by Untung Rahardja, Qurotul Aini, Dian of Mustika Putri in 2018 with the title "Automated Email System Utilization (AEMS) as the notification of learning outcomes assessment". This study discusses the use of media notification lecturer as a reminder for the process of entering the student value so that the RPU and head of the department can monitor[23]

3. Finding

3.1. Problem

The last stage is, students need to come to campus to see their value in the magazine wall and should be queued, this process is really time consuming and costly for students.

3.2. Problem Solving

In order to address the problems described above, there is a need for development in the assessment and input system so that the process of the input value can be done online, so as to facilitate the performance of lecturers and students Easily obtain the value result information. PEN + is used in the means of input and delivery of information about the student's value. Here is the program listing :

```
$count= count($modelModelsname->getListKelasDosenIndependentStudy(SelisihStatus,$selisih,$tahunAjar));
if ($count > 0) {
?>

<div class="panel panel-inf0">
    <div class="panel heading"> <i class="fa fa-paw fa-paw"></i> List Kelas Independent Study</div>

    <div class="panel-body">

    <div class="data Table_wrapper">

    <table class="displayPen table table-striped table-bordered dt-responsive nowrap" width=100%"
cellspacing="0" id="">
        <thread>
            <tr>
                <th>No</th>
                <th>Kelas</th>
                <th>Mhs</th>
                <th>Start Input s/d Dateline</th>
                <th>Submit</th>
                <th>Status</th>
            <tr>
        </thead>
        <body>
            <?php
```

```
$no = 1 ;

        foreach ($modelModelsname->getListKelasDosenIndependentStudy($SelisihStatus,$Selisih,$tahunAjar) as
$data) {

        $tglujian = ($data[$Tanggal] NULL ?'_' :
Yii:"$app->Modelsname->converterwaktu($data[$tanggal]));
        $tglUjianStart = ($data[$start] == '_' ? '_';
Yii::$app->Modelsname->converterwaktu($data[$Start]))
        $batasAkhirInput = ($data[$End] == NULL ? " : 's/d
Yii::$app->Modelsname->converterwaktu($data)[$End]));
        $tglSubmit = ($data[$DateSubmit] == NULL ? '_' ;
Yii::$app->Modelsname->converterwaktu($data[$DateSubmit]));
        $statusSubmit = $data[$StatusSubmit];
```

Figure 3. Process of input value

The picture above is a listing program for lecturers to process the input verification of independent study assessment.

3.3 Research Implementation

1. Front End Pen + display

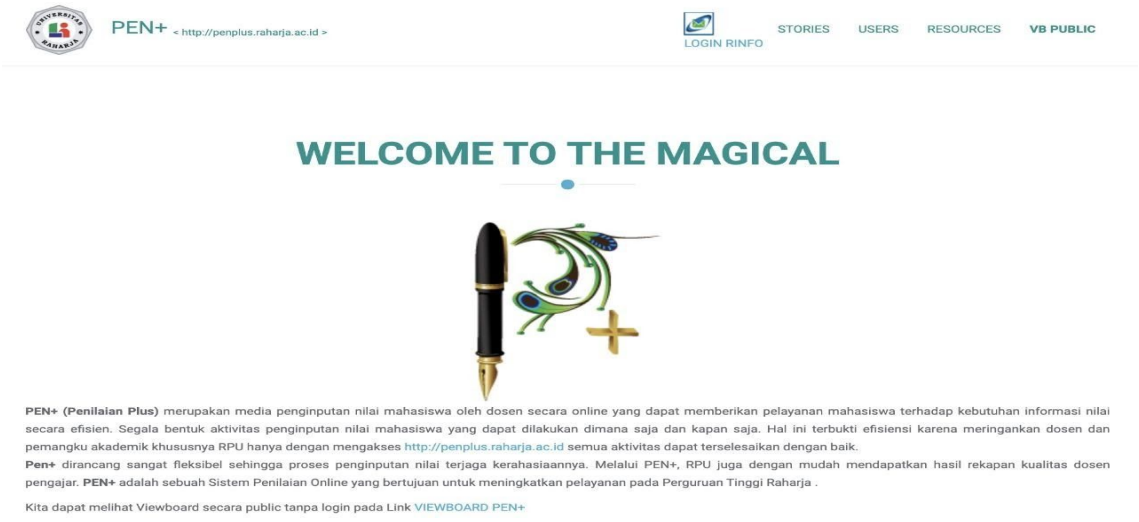

Figure 4. Main menu when lecturers access the pen + website http://penplus.raharja.ac.id/web/site/login

2. Independent Study Menu Display

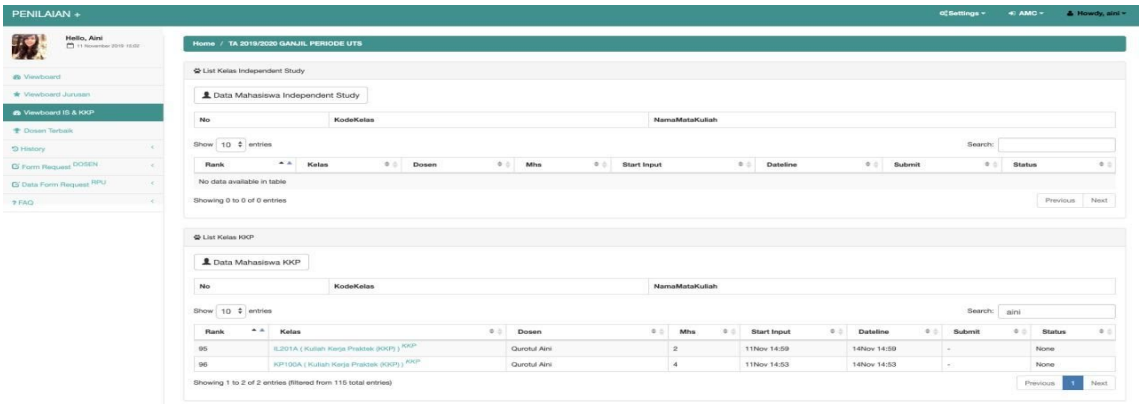

Figure 5. Independent Study Menu Display
in this view there is a list of classes Independent study that can be done by lecturers.

Figure 6. Independent Study class List View

3. Input penilaian IS

Figure 7. Display before input Grade

Figure 8. Display when input grade
In this view the value or value provided is only a grade

Figure 9. Display When Grade is Given

4. Independent Study Input Grade Results

Figure 10. Input Grade Independent Study final result

4. Conclusion

Based on what has been explained above, it can be concluded that the Independent study value input system in PEN + (valuation Plus) is an effective system in providing facilities for lecturers when making the input value process in the form of Independent Study Assessment becoming easier and more efficient.

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