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Management information system development at SMA N 1 Tompaso, Minahasa regency

Albrian Tandaju[1], Parabellem Rompas[2], Mario Tulenan[2]
[1] Master Student, Technical and Vocational Education Study Program, Postgraduate Program, Manado State University, Indonesia
[2] Technical and Vocational Education Study Program, Postgraduate Program, Manado State University, Indonesia

Abstract
This report card value processing system was created to facilitate the processing of student assessments and for homeroom teachers who play more roles than teachers, in general to students in their class, as a way to facilitate the processing of student report cards. Report cards are value information from the school received by parents. Aims to find out the progress of students during the learning process at school. "Development of Reporting Information System at SMA N1 Tompaso, Minahasa Regency" uses the research and development method or Research and Development (R&D) based on the Borg and Gall development model. The product specifications to be developed are as follows: This Report Report Information System is developed in the form of a website. The report card information system will be developed using HTML, CSS, Javascript, PHP programming languages and MySQL and apache databases as the web server and computer server as the hardware for this report card information system. The device needed to run this information system from the user's point of view is a PC or mobile computer equipped with a browser that supports HTML. Research products are developed through a series of trials and an evaluation is held at each trial activity, both evaluation of the results and evaluation of the process. It has met the requirements and the testing stage so that it can be concluded that the report card management information system has met the requirements and is feasible to be developed and used.

Keywords: information system, report card, borg and gall

Introduction

Information and communication technology has an important role in life for now and life in the future, including in the field of education which has triggered a tendency to shift from conventional face-to-face learning to digital learning that can be accessed using media, such as computers, without being limited by distance, and time by anyone who needs it. Moreover, with the influence of globalization, education will be more open and two-way, diverse, multidisciplinary, and related to competitive work productivity.

Information system is one form of technology application in the field of organization. An information system which in English is called Information System, is a system within an organization that meets the needs of daily transaction managers, supports operations, is managerial and strategic activities of an organization and provides information with the required reports.

The development of information technology has a great influence on the world of education and makes all involved try to balance these developments. Information technology systems can provide changes in the world of education, in this case data that is still manual can be changed in digital form.

The report card processing system at SMA N 1 Tompaso is still manual or handwritten. And still has some drawbacks such as taking a long time. This is due to the absence of an integrated database that collects student report cards. This fact provides an opportunity for people who want to cheat in certain things by changing the assessment of student report cards.

Therefore, this report card value processing system was created to facilitate the processing of student assessments and for homeroom teachers who play more roles than teachers, in general to students in their class, as a way to facilitate the processing of student report cards. Report cards are value information from the school received by parents. Aims to find out the progress of students during the learning process at school per semester. The report card contains reports on students' final grades, student attendance scores, and reports on good or bad student behavior by the teacher or homeroom teacher. The report card used is still in the form of a manual which still has the risk of being scattered and value data can be lost because it is not stored. In the process of working on report cards, it is manual and still has problems, such as some subject teachers working overtime and being late in submitting grades to the homeroom teacher.

Research Methods

A. Development Model

Research and Development (R&D) is a powerful research strategy or method for improving practice. What is meant by Research and Development or Research and Development (R&D) is a series of processes or steps in order to develop an existing product so that it can be accounted for. The product is always in the form of objects or hardware (hardware), such as books, modules, learning aids in the classroom or in the laboratory, but it can also be software (software), in the classroom or in the laboratory, such as computer programs for data processing, classroom learning., learning, training, guidance, evaluation, management systems, and others.

Research in the field of education in general is rarely directed at the development of a product, but is aimed at discovering new knowledge regarding fundamental phenomena, as well as educational practices. There is often a gap between basic research and applied research. Often faced with a gap between the results of research that is theoretical and applied research that is practical. This gap can be removed or connected with development research. In carrying out research and development, there are several methods used, namely the methods used, namely the methods: descriptive, evaluative, and experimental. Descriptive research is used in the initial research to collect data about existing conditions. Existing conditions include:

The condition of the existing products as comparison material or the basic material (embryo) of the product to be developed, the condition of the users (in the field of education such as schools, teachers, principals, students, and users of their grades).

The conditions of the supporting and inhibiting factors that hinder the use and use of the product to be produced, include the elements of educators, infrastructure, costs, management, and the educational environment in which the product will be applied.

The conditions of the supporting and inhibiting factors that hinder the use and use of the product to be produced, include the elements of educators, infrastructure, costs, management, and the educational environment in which the product will be applied. The evaluative method used to evaluate the product in the process of testing the development of a product. Research products are developed through a series of trials and an evaluation is held at each trial activity, both evaluation of the results and evaluation of the process.

Based on the findings of the trial results, improvements (model revisions) were carried out. The experimental method was used to test the efficacy of the resulting product. Although in the trial phase there has been an evaluation (measurement), but the measurement is still in the context of product development, there is no comparison group yet. In the experiment, measurements were made in addition to the experimental group as well as the comparison group or control group. The selection of the control and experimental groups in both groups can show the level of efficacy and the product to be used.

B. Development Producer

Basically, R&D research has the characteristics of a product resulting from its research. Products resulting from his research. The product of this research begins with an analysis of the needs of the research location. In the field of education, the products produced are generally in the form of learning media. However, in other fields it is considered more efficient than existing products. In general, the R&D model has been developed by several experts, one of which is the model developed by Borg & Gall (1983) who developed the R&D model through several stages, namely:

1. Research and Data Collection (Research & Information Collecting). The first step is a needs analysis, literature study and small research

a. Needs analysis is done by looking for information related to the problems faced by the location or area that is the target of product development. In addition, look for information or data related to what is needed to solve problems at that location. For example, if you are going to develop a product in a school, the researcher first finds out what learning problems are faced by teachers and students. Then, researchers also began to identify what things or products could solve learning problems at the school.
b. Literature study, related to the search for information and empirical data through relevant theories and research related to the product to be developed. This will guide researchers in developing the product to be produced.
c. Small-scale research, this is intended as a result of the identification that has been done by researchers regarding products that are needed to ascertain whether the product that the researcher will develop can really be a product that can solve problems at the place or school.

2. Research Planning (Planning). Planning in R&D research includes: formulating research objectives, estimating things needed in research, formulating researcher qualifications and forms of participation in research.

3. Design Development (Develop Preminary of Product). This stage includes

1. Create product designs to be developed
2. Determine the facilities and infrastructure needed during the research
3. Determine the stages of design testing in the field

4. Preliminary Field Testing. This stage is related to:

1. Conduct initial testing of product design
2. Testing is limited
3. Field trials are carried out many times in order to get a design that fits the needs. During this test, information was collected through observation, interviews and filling out questionnaires.

5. Revise the results of the trial (Main Product Revision). This stage is an improvement from the results of the initial field trials. At this initial product refinement stage, more is done with a qualitative product approach.

6. Field Testing (Main Field Testing). This stage relates to product testing more broadly, which includes

1. Testing the effectiveness of product design
2. Test the effectiveness of the design using the iterative model experiment technique
3. The result of the field test is an effective design, both in terms of substance and methodology. Data related to product users is collected to see the effectiveness and efficiency of the product

7. Revision of Field Test results (operation Product Revision)

This stage is the second improvement after a wider field test was carried out. Product improvement at this stage will further strengthen the product to be developed. Improvements at this stage are not only based on the quality aspect but also the quantity based on student learning outcomes which in the learning process have been tested to use the developed product.

8. Feasibility Test (Operational Field Testing)
This stage is related to testing the effectiveness and adaptability of product designs involving product users. This test is carried out using interviews, observations, questionnaires, which then the results are analyzed.

9. Final Product Revision
This revision is based on input from the feasibility test. This step will further refine the product being developed. Completion of the final product is deemed necessary for the accuracy of the developed product. At this stage, a product has been obtained whose effectiveness level can be accounted for.

10. Product Dissemination and Implementation (Desimination and Implementation)
Publish the results of the developed product so that it can be implemented in general or in a wider scope.

C. Product Trial
1. Trial Design
2. Trial Subject
3. Data Collection Techniques and Instruments
a. Interview by interviewing people related to this research
b. Documentation study, which is to collect the things needed
4. Data Analysis Techniques
a) Data Analysis Before in the Field
The analysis in this stage is carried out on data from preliminary studies, or secondary data that will be used by researchers to determine the focus of research at this stage is still temporary, and will certainly develop after researchers carry out research in the field. In preparing the proposal, the researcher determines the focus of the research to find data from data sources, including their characteristics.
b) Data Analysis While in the Field
At this stage, data analysis was carried out by collecting data directly through interviews or observations. For example, at the time of the interview, the researcher had analyzed the answers of the respondents. If the researcher is not satisfied with the answer from the respondent, then the researcher can continue the question again until a certain extent is obtained valid data
At the end of the stage, data analysis is divided into several parts, namely as follows:
- Domain analysis, which is to obtain a general and comprehensive picture of the object of research or social situation.
- Taxonomic analysis, which is a detailed description of the domain analysis through focused observation
- Componential analysis, which is looking for specific characteristics in every detail of the internal structure
- Analysis of cultural themes, which is looking for the relationship between the domain and its relationship with all components, finally being able to determine the theme/research

Results and Development Results
A. Initial Needs Analysis
In this stage, the researcher requires observation beforehand with the aim of finding problems. The needs analysis stage is to determine what is needed in the management information system product of SMA Negeri 1 Tompaso. These needs include information systems, as well as the needs of the devices used to create the information system which includes hardware and software.
Based on the analysis of the needs of the existing system, it can be said that the main function of the report card assessment system is to provide accurate and easy information for teachers and students as well as matters related to student grades. Based on the results of observations, the scoring system used is still conventional or in book form. Therefore, schools need systems that computerize information. From the results of the needs analysis, it is hoped that an assessment system at SMA N 1 Tompaso will use e-report products
1. Disadvantages of Early System
- It is still manual and done face-to-face which requires time for students, teachers, and parents
- In inputting student data, there are often errors or human errors
- The system is not yet computerized

2. Developed System Features
- Admin can login
- Can perform student data processing
- Can perform teacher data processing
- Can perform report card value data processing
- Can perform class data processing
- Can perform information system data processing
- Can perform data processing of student and teacher user names
- Can perform gallery data processing
- Can perform file processing or school archives on the system
- Can access subject value information
- Can make improvements to the value

3. System Specification
Specifications for this assessment system. The platform used is a web browser so that it uses a smart phone. To be able to access this system, you must be online or have an internet connection.

B. Product Development
Login Page
The Login page is the opening page to enter the information system page where the user must enter a username and password. There are 3 (three) kinds of users in this system, namely admins, teachers, and students.

Admin Page
This page contains admin personal data, and the admin main menu contains master data, folder data, competency data, basic competencies, assessments, user settings, reports, and exit navigation. Admins can also edit and delete everything on the admin page.

Teacher's Page
The teacher page contains student data, basic competencies, comments, assessments per KD, assessments, special prints, and exit navigation.

Student Page
This student page is quite simple, containing student self data, student grade data, and a menu to exit the system.

This stage includes product design that will be developed in the form of a model based on the identification of user needs and the results of observations. In product design, the researcher uses the Unifield Modeling Language (UML) system model. Namely Use Case Diagrams, Activity Diagrams, Sequene Diagrams.

Table 1: Definition of Actor Use Case Diagram

Admin	Act as the master data manager in the system.
Teacher	Can log in to access values and can make changes to values in the system.
Student	Can log in to access values on the page and can make requests to change values.

C. Expert Validation and Revision

1. Usability testing with Alpha testing techniques (Media Expert)

Based on the questionnaire given to media experts, the average value of the assessment instrument is obtained in the following table:

Usability Test Average Table with Alpha testing technique

Table 2: Usability Test

Aspects of Assessment	Media Experts I	Media Experts II
Benefit	4.6667	4.5
Design	4.7143	4.7143
Operation	4.8571	4.7143

Testing with the Alpha technique on the management information system of SMA N 1 Tompaso in Minahasa Regency. The test was carried out by 2 mobile application expert lecturers, namely Dr. Ir. V. R. Palilingan. The criteria for testing the Mobile application are described into 20 questions using a likter scale in the form of a checklist. The results of the Alpha test assessment (full details can be seen in Appendix 6) for media experts can be seen in the following table:

Table 3: Media Expert Test Result Data

Rating Scale	Total	Score	Total x Score
Strongly Agree (SS)	28	5	140
Agree (S)	12	4	48
Indecisive	0	3	0
Disagree (TS)	0	2	0
Strongly Disagree (STS)	0	1	0
Total Value			188
Maximum Value			200

From the results of the table above, it can be calculated the percentage as follows:

Percentage = 188/200 x 100% = 94.00%

The percentage result from the Usability aspect test is 94.00% and then it is matched with the conversion table according to table 10 so that the results are very feasible.

Usability testing with Beta testing techniques

Testing with the Beta technique on the management information system of SMA N 1 Tompaso in Minahasa Regency, carried out a field tryout. The research subjects involved 20 people. After the user has observed the entire product, the user is then asked to fill out a questionnaire. The results obtained are processed by Beta testing and then converted into presentation figures based on the criteria in table 10. The results of the tests for field trials can be seen in table 26 below:

Table 4: Field Trial Results Data

Rating Scale	Total	Score	Total x Score
Strongly Agree (SS)	139	5	695
Agree (S)	372	4	1488
Doubtful	85	3	255
Disagree (TS)	4	2	8
Strongly Disagree (STS)	0	1	0
Total Value			2446
Maximum Value			3000

Based on table 4, it can be obtained a presentation of the feasibility of the validation results from media experts as follows:

Percentage = 2446/3000 x 100% = 81.53%

The percentage result from the Usability aspect test is 81.53% and then it is matched with the conversion table according to table 10 so that the results are very feasible.

From the results of alpha testing by media experts and beta testing, respondents were asked to fill out an evaluation sheet that includes several aspects, namely aspects of compliance, design and operation for media experts and aspects of Usefulness, Easy of Use, Ease of Learning, Satisfaction for respondents which are used as guidelines for evaluating the application program on the management information system of SMA N 1 Tompaso in Minahasa Regency. From the results of tests carried out on the Usability aspect with Alpha testing techniques to media experts as many as 2 people, a value of 94.00% was obtained and then matched with the conversion table according to table 10 so that the results were very good because for the presentation of 81%-100% included in the category very good and the test to media experts got a score of 94.00%. And the tests carried out on the Usability aspect with the Beta technique to 20 respondents obtained the results of 81.53% then matched with the conversion table according to table 10 so that the results were very good because for the presentation of 81%-100% it was in the very good category and tested on media experts got a score of 81.53%.

Small-Scale Field Trial and Product Revision

Media testing was conducted by five media experts, five material experts, small-scale students, large-scale students, and teachers. Aspects tested in the media trial by material experts include (1) Relevance of content substance to competence (2) convenience (3) language. Based on the results of media testing by material experts, the average value of all aspects is very good with a feasibility percentage of 88%.

This shows that the appearance of the media application has been very good. Aspects that were tested in the media trial by media experts were visual appearance and implementation and software engineering.

The aspects tested in this small-scale student trial are (1) convenience (2) language, (3) visual and audio display, (4) software implementation and engineering, (5) usability. After conducting small-scale student trials, then the media was tested on large-scale students. The results of large-scale

student trials obtained that the average value of the aspects tested was very good with a feasibility percentage of 80%.

E. Large-Scale Field Trial and Final Product

a. Large-Scale Field Trial

The results of large-scale student trials obtained that the average value of the aspects tested was very good with a feasibility percentage of 80%. The aspects tested on a large scale are the same as those tested on a small scale. The results of large-scale student trials have increased when compared to the results of small-scale student trials. This result is in line with several previous studies that there is an increase in the percentage of eligibility in large-scale student trials [11, 12].

The media trial by the teacher consists of 6 aspects, namely (1) the relevance of the substance of the content to the competencies that must be achieved by students, (2) convenience, (3) language, (4) visual and audio display, (5) implementation and device engineering. soft, (6) expediency. The results of the trial by the teacher obtained that all aspects of the score were very good with a feasibility percentage of 94% (Table 5). This shows that the media is feasible to be used as a medium for chemistry learning.

b. The final product

Login page

There has been a change in the color display on the background from silver to black, apart from that, there has been a change in the display size in the Email input field, password and login options.

Admin Page

This page contains a user dashboard, a user in which there is my profile, edit profile, and student report cards, and contains a management menu, management submenu, and also a student page containing student data, as well as a teacher page containing teacher data, and there is navigation logout.

User Pages

This page can be accessed by teachers and students to view value information on the system using email and password. This page contains user profiles for both teachers and students, edit profile edits, student report cards, and logout navigation.

Conclusion

Based on the research and system test results that have been made, conclusions can be drawn which are formulated as follows: The management information system can provide easy information for teachers and students at SMA Negeri 1 Tompaso. This information system makes it easy for teachers to process student score data for report cards information needs. This information system also makes it easier for students to access their respective report cards and print report cards directly from the system. By using this school information system, various information on the value of student report cards in schools is delivered more quickly.

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