Evaluation Effectiveness of Information Systems Implementation
At the Faculty of Engineering Hasanuddin University

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ABSTRACT
This study aims to determine the level of evaluation effectiveness application of information systems at the Faculty of Engineering, Hasanuddin University. This research is a qualitative descriptive study with a survey method, the sample used by 172 respondents from Lecturers, Employees and Undergraduate Students in the Faculty of Engineering, Hasanuddin University. The research data was obtained from a questionnaire (primary), brainstorming, literature study and direct interviews with relevant parties according to the research objectives. Analysis of the data used in this study is a SWOT analysis (strength, opportunity, weakness, threat) to formulate an academic information technology system development strategy. The results of this study indicate that the total score for internal strength factors is 3.02. This number is needed as a process to find out where the intersection point (E) in the SWOT Diagram is. The total score for the internal weakness factor is 2.55. This number is also needed as a process to find out where the intersection point (E) in the SWOT Diagram is. Based on the determination of the area, the quadrant I is the most extensive, as well as the location of the intersection point located in quadrant I, so that the main strategy of developing Information Systems at FT Unhas Makassar is the SO strategy. While alternatives to the development of Information Systems at FT Unhas Makassar are ST, WO and WT.

Keywords: Information Systems, Strategy, SWOT Analysis

Introduction
In the era of globalization, the development of information technology is increasingly powerful which greatly affects nation states in the world. Globalization, which is defined as a process of unifying the world which includes various areas of the world order contains the characteristics of changes in openness, creativity, sophistication, speed, attachment, excellence, strength and free competition (Tjokronegoro, 2000).

Based on the entity and its properties, academic information systems refer to a set of systems and activities that are used to organize, process, and use information as a source in the organization (Sprange & Carlson, 1982).

According to Lasar (1995) identified these two inhibiting factors, namely: technical and non-technical factors. Technical factors include: (1) Technology and infrastructure. Academic Information System Management requires the right computer, internet network and technology. The current problem is that not all tertiary institutions have the technology and infrastructure, especially in remote areas; (2) Material design.

The delivery of academic data content through the Academic Information System needs to be packaged in a centered form of the parties involved in the learning process (student-lecturer stakeholders). Currently there are very few designers. Non-technical factors include: (1) Culture. The use of ICT-based Academic Information Systems requires a culture of access and independent learning and a habit of learning or following developments via the computer.
The current issue is whether the independent learning culture is owned by all parties related to the learning Academic Information System process, namely staff, lecturers, and students; (2) Technology illiteracies. To be honest, there are still many administrative staff, even educational practitioners and students who have not mastered computer and internet technology, or other ICT-related. This is actually not only due to a lack of interest or willingness to learn, but also due to the absence of adequate computer facilities and internet services or the absence of internet fees, especially those who are less well off financially (control areas).

Today Indonesia is in the information age. Such a view is indeed true because as is well known one of the phenomena that is worldwide and taking place with very high density is the development and various breakthroughs in the field of information technology. Information technology plays an important role in improving the quality of an agency. Its use is not only as an automation process for access to information, but also creates accuracy, speed, and completeness of an integrated system, so that the organizational processes that occur will be efficient, scalable, flexible.

The characteristic of modern society today is the increasing need for the type and amount of information needed for various purposes. This is also faced by all types of organizations. Whether it's a large organization or a small organization. In accordance with the increasingly advanced times, information is needed and very necessary by humans in the means to help increase creativity and activity in a job. Given the importance of information as an element of resources, everything related to information should be designed and arranged in such a way as to become an information system that is useful for the benefit of organizational managers.

The use of information in an organization serves as a consideration in problem solving and decision making which is then applied in the form of services. This is due to the limited ability of humans who can not predict the impact of a decision taken. Therefore, one function of information is to reduce existing uncertainty. In accordance with the rapid development of the times, the procedures for handling information use sophisticated tools such as computers and other supporting tools, thereby facilitating the process of handling information used in managerial activities.

The increasing use of information technology, particularly the use of the internet, has led every individual to carry out various activities with more accuracy, quality and on time. Every organization can take advantage of the internet and information technology networks by carrying out various activities electronically. So that in organizational life it is demanded the availability of an information system with the support of computer, data or information facilities, as well as ready and capable Human Resources (HR) as the main thing in the application of modern management.

There is an increase in the load of activities and the need for information that is timely, fast and accurate, integrated and reliable for all levels of management within the organization concerned as well as for cross-sectoral information exchange from and to existing agencies and agencies, if not supported by a Management Information System (SIM) which is reliable by using appropriate technology, the need for accurate information can be fulfilled properly. In facing the growth and development of an organization which is already so complex, it is necessary to have a management information system capable of assisting the provision of data and information as material for determining development policies and strategies as well as for the availability of operational data and information.

The Faculty of Engineering stated that the information system was implemented in the Faculty of Engineering in 2007. The strategic relationship in implementing the effectiveness of information systems is that it can measure user satisfaction which is the basis for the development of existing information systems at the Faculty of Engineering, Unhas.
information system development strategy starts from measuring user satisfaction to identify the existence of strengths, opportunities, but simultaneously minimizes weaknesses and threats.

This management information system was developed by Unhas together with the World Bank through Project I-Mhere B2.2a Batch II in 2007-2010, with the aim of developing good University governance and effective University management, and accountability so that Hasanuddin University will be ready to enter the competition global.

Factors that can influence the improvement of study programs in both public and private tertiary institutions are good information systems, producing quality alumni, market demand, development of science and technology including exponential information technology as well as excellent service delivery and quality of human resources. These factors encourage higher education to continue to develop, including the development of quality facilities, teaching staff, educational staff, academic services and other fields.

Such as the provision of academic services is not only used for students but also for all parties who need information between prospective students, parents of students, local and central governments including related ministries, partner institutions and job seekers. Therefore, universities should continue to develop in the field of academic information services by using better information systems.

Information technology in the academic field can be used in the information management process, starting from entering data, storing, and updating at any time, everyone can get the latest information and perform analysis easily. The positive impact is that the process of storing, delivering messages, information, and knowledge will be more precise, quick and easy.

Like the academic information system, it does not only cover the teaching and learning process, but includes everything from information on new student admissions, selection of new students to the graduate process. The output of this information system is expected to provide information that is in accordance with what is expected by the public and up to date for each user.

Management of information systems as a form of service improvement that pampers customers. Apart from that the information system is also an important resource in the organization. The information system is also the most appropriate reference for use by leaders / managers in decision making (decision making). Accurate information system output, the leader can determine the organization's strategic plan that can achieve competitive advantage (Maupa, 2010). It is also supported by the results of empirical research which, such as that carried out in private universities in Yogyakarta, are at a medium maturity level, which indicates that the application of information systems in private universities has not been carried out, even though PTS as one of the fields that prepares human resources, is required to apply all forms of application of technology that is beneficial to the development of education itself.

In the implementation of processing and fostering information systems in tertiary institutions, it will be increasingly complex and better with a better and tertiary management system. Therefore, it is necessary to have available data and information that is accurate and up to date in determining decisions that are in accordance with operations. Therefore, the improvement and stabilization of the management of staffing and student management information systems is a means of presenting data and information on staffing and student affairs along with the development of the scope and diverse management of staffing and student management in accordance with the level of organizational development.

Based on the background that has been stated, this research tries to examine a thesis entitled "Evaluation Effectiveness of the Application Management Information Systems at the Faculty of Engineering, Hasanuddin University".
LITERATURE REVIEW

Information Systems

Myers (2002) suggests that an Information System is a combination of people, technology facilities, media, procedures and controls aimed at getting important communication channels, processing certain types of routine transactions, giving signals to management and others about events important external and internal events and provided a basis for his ingenious decision making. Relating to the concept of information systems. A system within an organization that meets the daily transaction management needs, supports operations, is managerial and strategic activities of an organization and provides certain outsiders with the necessary reports (Maupa, 2009).

Strategy

Strategy is the center and the distinctive core of strategic management. Strategy refers to the formulation of the tasks, goals and objectives of the organization, policy strategies and main programs to achieve them; and the methods needed to ensure that the strategy has been implemented to achieve the ultimate goals of the organization (Steiner and John, 1997). According to Jorfi, Yaccob and Shah (2011), strategic management is one of the subjects being discussed and it is increasingly interesting in the field of development management. Strategic management is a systematic approach to the primary and increasingly responsible importance of general management for positioning and relating the organization to its environment in a way that will ensure success and make it safe from surprises. Wheelen (2000: 35), suggests the basic elements of strategic management as follows: "Strategic management consists of four basic elements: Environmental scanning, Strategy formulation, Strategy implementation, Evaluation and control.

SWOT Analysis

SWOT analysis is the systematic identification of various factors to formulate a strategy. This analysis is based on a logic that maximizes the strengths (strengths) and opportunities (opportunity), but simultaneously and can minimize weaknesses (weaknesses) and threats (threats). The strategic decision-making process is always related to the development of mission, goals, strategies and policies. Thus, strategic planning must analyze strategic factors (strengths, weaknesses, opportunities and threats) in the current conditions. (Salusu: 2002).

Conceptual Framework

![Conceptual Framework Diagram]
RESEARCH METHOD
Population and Sample
This research is a qualitative descriptive study with a survey method, the sample used by 172 respondents from Lecturers, Employees and Undergraduate Students in the Faculty of Engineering, Hasanuddin University.

Method of collecting data
The data collection was carried out using a closed type questionnaire, which consisted of a series of questions used to obtain data on several factors that formed the variable management information technology system development strategy, SWOT (strengths, weaknesses, opportunities, and threats).

Technique Analysis
The research data was obtained from a questionnaire (primary), brainstorming, literature study and direct interviews with relevant parties according to the research objectives. Analysis of the data used in this study is a SWOT analysis (strength, opportunity, weakness, threat) to formulate an academic information technology system development strategy.

RESULTS
Internal Environmental Analysis
The analysis of the internal environment is obtained through the identification of the strengths and weaknesses that are faced in efforts to develop Information Systems at the Faculty of Engineering, Hasanuddin University Makassar, which can be explored in the following discussion.

Strength
The strengths that are owned in the context of efforts to develop academic information systems at the Faculty of Engineering, Hasanuddin University, include:

a. The existence of budgeting funds for the development of the Information System in the Annual Activity and Budget Plan (RKAT). In the RKAT of each department in the Faculty of Engineering, Hasanuddin University is available for the development of Information Systems depending on each department.
b. The existing information system can be integrated with the new system. If there is a change in the name or model for a new system, the old data can be retrieved and then entered into the new system

c. Leadership support for the development of Information Systems. Hasanuddin University Faculty of Engineering leaders give great attention and support in the context of developing Information Systems (Information Systems). They understand that with technology can make work easier and the level of affordability and speed is relatively high. This can also support the achievement of the vision and mission of the Hasanuddin University Faculty of Engineering.
d. There are already institutions that are responsible for the maintenance and procurement of faculty-level facilities. The Management Information System in the Faculty of Engineering, Hasanuddin University already has a team that if needed or if there is a problem there is an IT staff stationed at the Faculty of Engineering Unhas to fix it.
e. Information System application program has been running well. This means that the existing application runs as needed, but there are still needs that cannot be covered by the existing system, the available team still needs information from the user for system improvement
f. There is always a plan to advance the existing Information System. If there is a request for additional items in the system the University Information System team will hold it.

g. The large number of employees who can serve as admin. High motivation to work admin staff for the development of Information Systems. Where Admins at the Faculty of Engineering Unhas have the competence and experience in managing existing Information Systems, they are also aware that with the Information System the workload will be reduced, so they can do other things.

h. The large number of lecturers who participate in the development of Information Systems. Every year the lecturers always increase.

i. The high ability of students and lecturers to access the system. Every year, the number of lecturers and students is always increasing, so each year, the ones who are increasingly accessing the internet are lecturers and students

**Weakness**

The weaknesses that are felt in the framework of efforts to develop academic information systems at the Faculty of Engineering, Hasanuddin University include:

a. The Faculty of Engineering, Hasanuddin University is far from the main campus so that the existing Information System requires to make connections. The existing facilities are not sufficient to meet the needs of the Engineering Faculty

b. Facilities, for example, the generator lights are not able to provide electricity and other facilities.

c. There is no strategic plan in updating system equipment. The existing equipment in the Faculty of Engineering is old (computer)

d. Delay in maintenance and repairs. It is necessary to add more IT personnel in the Faculty of Engineering, Hasanuddin University

e. The ability of employees still needs training. There are some users who do not understand how to access the existing system.

f. Computer facilities are not up to date Need to change computers

g. The existing information system is always changing. Because the information system is always changing, it becomes difficult for users to access quickly.

**External Environmental Analysis**

Analysis of the external environment is obtained by identifying the factors of opportunities and threats faced in efforts to develop academic information systems at the Faculty of Engineering, Unhas Makassar.

**Opportunity**

Some conditions that will become opportunities in the context of efforts to develop an academic Information System at the Faculty of Engineering Unhas include:

a. Cooperation / assistance with Computer Information Technology in system development. Can work with companies in the field of Computer Information Technology in system development

b. The number of enthusiasts from students every year. Every year the student admissions are increasing

c. The existence of an Information System Development Program by the university team in accordance with the Unhas Strategic Plan. In the University's Strategic Plan has been stated for the development of technology to achieve the University's Vision and Mission

d. The ability of users to access the internet from outside the campus. The use of the system can be used at home even if it is not at the campus
e. There is already an institution that is responsible for developing Information Systems at the University level. There are IT institutions formed by the leadership of the University
f. The number of graduates in the Information Technology

**Threat**

Threats faced in the framework of efforts to develop academic information systems at the Faculty of Engineering, Hasanuddin University include:

a. The high expenditure of funds for the cost of repairs and maintenance. Maintenance costs will increase after the construction of the Information System at the Faculty of Engineering, Hasanuddin University
b. High price of components for repairs and maintenance
c. For software maintenance to repair the system is too expensive.
d. Use of illegal / pirated software
e. Many computers in the Engineering Faculty admin use pirated windows
f. There are parties who can hack the system. The system is still under threat both now and in the future because it can still be tampered with by irresponsible hands. Such as values that already exist in the system can be changed without the admin's knowledge. Computer viruses that can attack the system at any time, have fatal consequences and even lose data.
g. Human resource administrator limitations. Human resources for administrators still need to be added

**Internal and External Factor Weight, Rating and Score Analysis**

**Table 1**

| No | Statement                                                                 | Weight | Rating | Score |
|----|---------------------------------------------------------------------------|--------|--------|-------|
| 1  | **Strength**                                                              |        |        |       |
| 1  | The existence of budgeting funds for the development of INFORMATION SYSTEM in the Annual Activity and Budget Plan (RKAT) | 10.3%  | 2.88   | 0.30  |
| 2  | The existing information system can be integrated with the new system     | 11.2%  | 3.08   | 0.35  |
| 3  | Leadership Support in developing the INFORMATION SYSTEM                   | 11.4%  | 3.10   | 0.35  |
| 4  | There is already an agency responsible for the maintenance and procurement of faculty-level facilities | 11.2%  | 2.87   | 0.32  |
| 5  | Academic INFORMATION SYSTEM application program has been going well       | 11.3%  | 3.07   | 0.35  |
| 6  | There is always a plan to advance the existing Information System         | 11.0%  | 3.06   | 0.34  |
| 7  | The large number of employees who become admins                           | 10.7%  | 3.01   | 0.32  |
| 8  | The large number of lecturers who participate in the development of Information Systems | 11.2%  | 2.98   | 0.34  |
| 9  | The high ability of students and lecturers to access the system           | 11.4%  | 3.12   | 0.36  |
|    | **Total**                                                                 | **100.0%** | **27.18** | **3.02** |
| 1  | **Weakness**                                                              |        |        |       |
| 1  | The Hasanuddin University Faculty of Engineering is far from the existing Information System parent so it requires a third party to establish a connection | 12.9%  | 2.61   | 0.34  |
| 2  | The existing facilities are not sufficient to meet the needs of the Engineering Faculty | 12.5%  | 2.54   | 0.32  |
| 3  | There is no strategic plan in updating system equipment                    | 12.7%  | 2.52   | 0.32  |
| 4  | User Capability Still Limited                                             | 12.6%  | 2.54   | 0.32  |
| 5  | Delays in maintenance and repairs                                         | 12.3%  | 2.57   | 0.31  |
| 6  | The ability of employees still needs training                             | 12.7%  | 2.59   | 0.33  |
| 7  | Computer facilities are out of date                                       | 12.8%  | 2.55   | 0.31  |
| 8  | The existing information system is always changing                        | 12.0%  | 2.51   | 0.30  |
|    | **Total**                                                                 | **100.0%** | **20.43** | **2.55** |
Based on the table above, it shows that the total score for the internal strength factor is 3.02. This figure is needed as a process to find out where the intersection point (E) in the SWOT diagram is located. The table above also shows that the total score for the internal weakness factor is 2.55. This figure is also needed as a process to find out which position the intersection point (E) in the SWOT diagram is at. To find out which quadrant is the location of the internal environmental factors in the SWOT diagram, an analysis called internal factor analysis is used. The results of this analysis can be found using the formula Strength minus Weakness (Strengths-Weakness). For more details, see the analysis below. Internal factor analysis

\[
\text{Internal factor analysis} = \text{Strength} - \text{Weakness} \\
= 3.02 - 2.55 \\
= 0.47 \text{ (positive)}
\]

| Table 2 | Score Analysis |
|---------|----------------|

| No | Statement | Weight | Rating | Score |
|----|-----------|--------|--------|-------|
| 1  | Collaboration with Computer Information Technology in system development | 16.4%  | 3.07   | 0.51  |
| 2  | The number of students each year | 16.4%  | 3.04   | 0.49  |
| 3  | Development Program by the university team according to the Unhas Strategic Plan | 16.4%  | 3.21   | 0.54  |
| 4  | The ability of users to access the internet from outside the campus | 16.4%  | 3.11   | 0.50  |
| 5  | There is already an institution that is responsible for developing Information Systems at the University level | 16.4%  | 3.19   | 0.56  |
| 6  | The number of graduates in the field of Information and Computer Technology | 16.4%  | 3.09   | 0.52  |

| Total | 100.0% | 18.71 | 3.12 |

| Threat | 100.0% | 14.90 | 2.98 |
|--------|--------|-------|------|
| 1      | High expenditure on funds for repair and maintenance cost | 20.1% | 2.85  | 0.57 |
| 2      | High price of components for repair and maintenance | 20.1% | 3.00  | 0.6   |
| 3      | Use of pirated software | 20.1% | 2.80  | 0.57 |
| 4      | There are parties who can hack the system | 20.1% | 3.25  | 0.67 |
| 5      | Unavailability of HR administrators | 20.1% | 3.01  | 0.56 |

| Total  | 100.0%  | 14.90 | 2.98 |

Source: Data Process 2020

Based on the table above, it shows that the total score for the opportunity external factor is 3.12. This number is needed as a process to find out where the intersection point (E) in the SWOT Diagram is. This table also shows that the total score for external threats is 2.98. This figure is also needed as a process to find out which position the intersection point (E) in the SWOT diagram is at. To find out which quadrant the external environmental factors are located in the SWOT diagram, an analysis called external factor analysis is used. The results of this analysis can be determined using the Opportunity minus Threats formula. For more details, see the analysis below. Analysis of external factors:

\[
\text{Analysis of external factors} = \text{Opportunity} - \text{Threat} \\
= 3.12 - 2.98 \\
= 0.14 \text{ (positive)}
\]
Table 3
SWOT Analysis

| FAS (internal strategic factor analysis summary) | STRENGTHS | WEAKNESSES |
|-----------------------------------------------|-----------|------------|
|                                               |           | Harvard University's Faculty of Engineering is far from the existing Information System parent, thus requiring a third party to establish a connection. |
|                                               | Funds are budgeted for the development of the Information System in the Annual Activity and Budget Plan (IKAT) | |
|                                               | The existing information system can be integrated with the new system | |
|                                               | Leadership Support in developing Information Systems | |
|                                               | There is already an agency that is responsible for the maintenance and procurement of faculty-level facilities | |
|                                               | Academic Information System application program has been running well | |
|                                               | There is always a plan to advance the existing Information System | |
|                                               | The large number of employees who become admins | |
|                                               | The large number of students participating in the development of Information Systems | |
|                                               | The high ability of students and lecturers to access the system | |

| EFAS (external strategic factor analysis summary) | | |
|------------------------------------------------|-------------------------------|-------------------------------|
| Opportunities | Supporting the development of Information Systems at the Faculty of Engineering, Hasanuddin University. | Planning for the development of Information Systems. |
|               | Coordinating with University Leaders in developing Information Systems at the Faculty of Engineering, Hasanuddin University. | Budgeting in the Faculty of Engineering Unit- IKAT. |
|               | Providing equipment to support Information Systems at the Faculty of Engineering, Hasanuddin University. | |
|                | Performance in routine maintenance for basic facilities and supporting facilities to ensure the smooth teaching and learning process and administration at the Faculty of Engineering, Hasanuddin University. | |
|                | Supporting the development of Information Systems at the Faculty of Engineering, Hasanuddin University. | |
|                | The high price of components for repair and maintenance | |
|                | The quality of the hardware | |
|                | The availability of human resources administrators | |
| Threats | Harvard University's Faculty of Engineering is far from the existing Information System parent, thus requiring a third party to establish a connection. | |
|               | The existing facilities are not sufficient to meet the needs of the Engineering Faculty | |
|               | There is no strategic plan for updating system equipment | |
|               | User capabilities are still limited | |
|               | Delay in maintenance and repairs | |
|               | The ability of employees to handle information system problems at the Faculty of Engineering, Hasanuddin University. | |
|               | The existing information systems are always obsolete | |

Source: Data Process 2020

SO Strategy (Strength Opportunity)

The strategy of combining strengths and opportunities, using all strengths to take advantage of opportunities with the following strategies:

a. Perform routine maintenance for basic facilities and supporting facilities to ensure the smooth teaching and learning process and administration at the Faculty of Engineering, Hasanuddin University.
b. Delivering users that information systems can be used wherever they are.
c. Held additional IT personnel to handle information system problems at the Faculty of Engineering, Hasanuddin University.

ST Strategy (Strength Threat)

The strategy for the combination of forces and threats, by using all the strengths owned by avoiding threats, namely with the following strategies:

a. Supporting the development of Information Systems at the Faculty of Engineering, Hasanuddin University.
b. Coordinate with University Leaders in developing Information Systems at the Faculty of Engineering, Hasanuddin University.
c. Providing equipment to support Information Systems at the Faculty of Engineering, Hasanuddin University.
WO Strategy (Weakness Opportunity)
Strategies in a combination of weaknesses and opportunities, to take advantage of existing opportunities by overcoming existing weaknesses, namely with the following strategies:

a. Planning for the development of information systems.
b. Budgeting in the RKAT of the Faculty of Engineering Unhas.
c. Building cooperation between users and the existing IT team at the Faculty of Engineering, Hasanuddin University.

WT (Weakness Threat) Strategy
Strategies can be combined weaknesses and threats, to minimize weaknesses and to avoid threats with the following strategies:

a. Program for computer refresh.
b. Minimizing the use of pirated devices.
c. Conduct training for admins in the Faculty of Engineering Unhas.

CONCLUSION AND SUGGESTION
Based on the results of the research that has been done, it can be concluded that: The total score for the internal factor of strength (strength) is 3.02. This number is needed as a process to find out where the intersection point (E) in the SWOT Diagram is. The total score for the internal weakness is 2.55. This figure is also needed as a process to find out which position the intersection point (E) in the SWOT diagram is at. Then, based on the determination of the area of the area, quadrant I is the widest, as well as the location of the intersection is located in quadrant I, so the main strategy of developing the Information System in FT Unhas Makassar is the SO strategy. Meanwhile, alternatives to the development of Information Systems at the FT Unhas Makassar are staretgi ST, WO and WT.

The results of this study can be used as input and consideration for policy makers (Hasanuddin University Faculty of Engineering) in determining directions and policies related to the development of management information systems, especially academic information systems.

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