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Analysis of the implementation of the scheduling and tracking project application at CV. Emporio architect

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ABSTRACT
CV. Emporio Architect make a Scheduling and Tracking Project application is created to help employee performance in scheduling a project. However, the implementation in the field had not met expectations, where each division made its own schedule and kept it individually, so that there was no transparency in the performance of the inter-divisional relay teams. This was because many divisions did not use the applications provided by the company. From the background description above, it is necessary to identify the factors that influence the use of Scheduling and Project Tracking applications on CV. Emporio Architect. The aim of this research is to analyze the implementation of the Scheduling and Tracking Project application by identifying factors that influence the use of the application using the TOE Framework research model and quantitative methods with data collection techniques through questionnaires, interviews and observation. The population in this study consisted of 58 respondents, and the data analysis was conducted using validity tests, reliability tests, multiple linear regression analysis, and hypothesis testing. The data testing was processed with the help of SPSS software. The research results identified that the variables of technology and organization did not significantly affect the implementation of the application, leading to the ineffectiveness of the application implementation at CV. Emporio Architect, as expected. However, the environmental variable had a significant influence according to the conditions at CV. Emporio Architect. The suggested recommendation is that the company improves from both technological and organizational aspects so it can be better at preparing for implementing scheduling and project tracking applications at CV. Emporio Architect.

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INTRODUCTION

CV. Emporio Architect is one of the Architectural and Interior design service consultants in Indonesia which has been established since 2010 and is carried out directly by a team of professionals in their field. Emporio Architect has more than 300 employees spread across several branch offices, namely Bali, Jakarta, Yogyakarta, Surabaya, Bandung, Semarang and Balikpapan.

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In the process of working on a design project, Emporio Architect works as a team with several divisions and during the process of transferring work between other divisions, obstacles are often encountered, for example tracking and monitoring schedules at the design stage in each division. Due to differences in divisions, divisions do not know the schedule and targets determined by other divisions in the process of working on a project design. Due to internal coordination and communication problems, a system was created to make it easier for the team to inform the schedule, as well as to help in providing information on design progress to clients without disturbing other divisions with the name Scheduling and Project Tracking applications.

The implementation of the Scheduling and Tracking Project application has been running since 2021, however, because many staff do not use it and there are features that are still not suitable, the application system has been updated again. At the beginning of 2023, the application update will be ready for use, but implementation in the field is still not up to expectations, where there are still many staff who make their work schedules manually without inputting them into the application, causing similar problems again. Based on the description presented, it can be identified that there is unpreparedness in the acceptance and implementation of applications at CV. Emporio Architect.

This research focuses on analyzing the implementation of project scheduling and tracking applications using the TOE Framework.[1]explained, the approach that can be used to analyze the implementation of the adoption of a new application or system is to use the TOE (Technology, Organization and Environment) Framework. The TOE Framework has three factors or aspects, namely technology, organization and environment. [2] explained that the TOE Framework has been used in many studies aimed at analyzing factors that are related and can influence the implementation or adoption of information technology innovation in organizations and companies.

This approach is suitable for this research because it includes three variable elements, namely technology, organization and environment which are also owned by CV. Emporio Architect. This research was carried out in order to find out what factors influence application implementation in the field by conducting data analysis tests by distributing questionnaires to users/staff using the application, so that it can be used as input and consideration for stakeholders in preparing strategic plans for Scheduling and application development. Tracking Project for staff at CV. Emporio Architect on an ongoing basis.

METHODS

Literature Review

Analysis

According to [3]Analysis is the process of systematically searching and compiling data obtained from interviews, field notes and documentation, by organizing data into categories, describing it into units, synthesizing it, arranging it into patterns, choosing what is important and what will learn, and make conclusions so that they are easily understood by yourself and others.

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Implementation

Implementation is an activity carried out to assess, evaluate and measure whether the policy can run properly and requires assessment or not[4][5].

Application

An application is software that is created with various attribute components that suit the user in order to assist the user in processing any data to produce input and output[6].

Scheduling

Scheduling is planning work sequences and resource allocation for each operation. Scheduling jobs in production systems is a very important problem. This scheduling allows an order to be completed according to the contract[7].

Tracking

Delivery tracking is used to track the location and status of goods delivery from the sender to the recipient. This can be done in various ways, such as using the delivery number or codes received by the sender and recipient[8].

TOE Framework

TOE Framework or The TOE (Technology Organization Environment) framework was first developed by Tornatzky, L.G. and Fleischer in 1990 [8] which initially served to explain technological innovation, namely the process of adopting and implementing technology in 3 different contexts, namely technology, organization and environment.

According to [9] The TOE framework explains the adoption of technological innovation by providing three analytical frameworks that can be used to study the adoption of various types of IT innovation, the technological framework explains the relevant existing or new technologies used by the company, the organizational framework is based on the scope and size of the company, the environmental framework in which the company conducts its business which refers to industry, competitors and relations with government.

Framework of thinking

In this research, the TOE framework was adapted and adapted to the research context to identify aspects and indicators that can influence the implementation of Project Scheduling and Tracking applications on CV. Emporio Architect. The aspects or factors identified based on the TOE framework that influence the implementation of Project Scheduling and Tracking applications on CV. Emporio Architect, namely technology, organization and environment, where each factor is analyzed using multiple linear regression analysis techniques.

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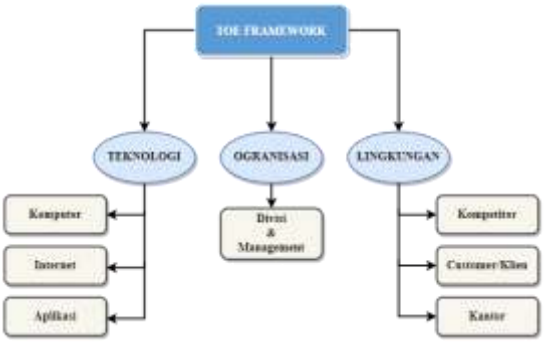

Figure 1. Research framework

Based on Figure 1, the TOE Framework model on CV. Emporio Architect is divided into 3 parts which refer to the theoretical framework of the TOE Framework, namely Technology, Organization and Environment. The image above can explain that CV. Emporio Architect has fulfilled the elements required to carry out analysis using the TOE Framework. The first variable is Technology, supporting elements, namely computers, the internet and also applications used for the design process. The second variable is Organization, supporting elements, namely the existence of divisions and management that regulate the course of the design process. Lastly, the Environmental Variable, namely the presence of competitors as business competitors, customers/clients and also available offices.

Research Hypothesis

Based on the main problem and theoretical studies described above, the hypothesis in this research is as follows:

1. Technological variables have a positive and significant effect on the implementation of Scheduling and Project Tracking applications on CV. Emporio Architect.
2. Organizational variables have a positive and significant effect on the implementation of Scheduling and Project Tracking applications on CV. Emporio Architect.
3. Environmental variables have a positive and significant effect on the implementation of Scheduling and Project Tracking applications on CV. Emporio Architect.

Data analysis

Data analysis is an activity carried out to change the research data obtained, which is then used to answer problems in the research, so that the research objectives can be achieved. The data analysis technique used in this research is multiple linear regression analysis which can be described as follows:

1. Validity test
2. Reliability Test
3. Multiple Linear Regression Analysis
4. Simultaneous Hypothesis Testing (F-Test)
5. Partial Hypothesis Test (t-test)

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Research methods

Types of research

This research uses the TOE Framework model or TOE (Technology Organization Environment) framework which is able to influence and determine decisions on how the implementation of an application or information technology develops. There are several reasons why the TOE framework was chosen as a theoretical framework to support this research, namely:

1. The TOE framework is suitable for studying adoption in the context of business entities.
2. The TOE framework has a clear theoretical basis and consistent empirical support.
3. The TOE framework is consistent with theories of IT innovation at other organizational levels, which strengthens and enhances the explanatory power of the framework.
4. The TOE framework is seen as a comprehensive framework so that it can be used to study information technology adoption.
5. These three contexts (technology, organization, and environment) offer advantages over other adoption models because the TOE framework provides a comprehensive view of the factors that influence IT adoption decisions[10].

Research Population and Sample

The population in this study are all employees who use the Scheduling and Tracking Project application on CV. Emporio Architect . Based on data from the CV company. Emporio Architect found that the number of employees using the Scheduling and Tracking Project application was 139 people. Determining the number of samples in this study used the Slovin formula.

$$n = \frac{N}{1+N.e^2} = \frac{139}{1+139.(0,1)^2} = 58.16 \quad (1)$$

Information:

n = number of samples
N = total population
e = margin of error

Based on the results of the Slovin formula formulation above, the number of samples in this study was 58 people.

Research procedure

This research procedure can be described as a flowchart that describes the process flow in designing and creating an analytical model, which can be seen in 3.1 regarding the research design procedure. Judging from the approach, this research includes a quantitative approach with a causal design, because this research will try to determine cause and effect relationships and test the hypotheses that have been determined on correlated variables.

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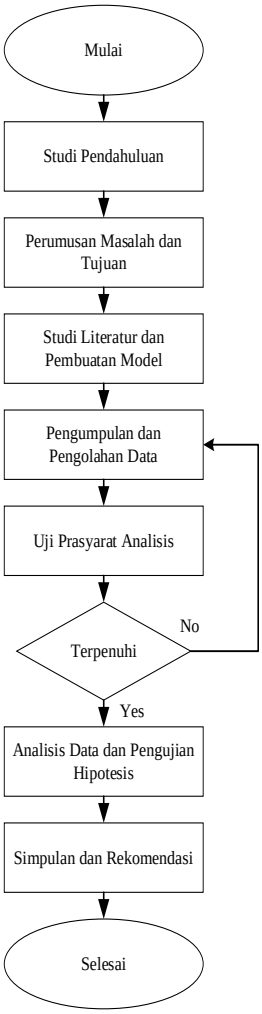

Figure 2. Research design procedures

Research variable

The variables used in research can be identified into two, namely the independent variable and the dependent variable.

1. The independent variable (X) is a variable that is not dependent and is not influenced by other variables, but can influence other variables. The independent variables in this research are technology (X1), organization (X2) and environment (X3).
2. The dependent variable (Y) is a variable that is dependent and influenced by other variables or as a result of the existence of other variables. The dependent variable in this research is the implementation of the e-Letter application in OPDs in Tabanan Regency (Y)
3. TOE Framework variables are variables that will be used as factors to be studied, namely technological variables, organizational variables and environmental variables.

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Data collection technique

The techniques used to obtain the data needed in this research in order to achieve the objectives of this research can be described as follows.

1. Questionnaire
2. Observation
3. Interview
4. Literature review

Research Instrument

The research instrument used to collect data for this research uses a questionnaire containing a list of statements regarding the implementation of the Scheduling and Tracking Project application from each statement item or indicator for each variable in the research which is measured using a Likert scale.

The Likert scale is a scale that can be used to measure a person's attitudes, opinions and perceptions about a particular object or phenomenon. This study uses an odd Likert scale in the form of positive statements which are given a score of 5, 4, 3, 2 and 1. Below are shown the criteria and scores for the Likert scale answers in this study.

Table 1. Answer Criteria and Odd Likert Scale Scores

No.	Answer Criteria	Score
1	Strongly Agree (SS)	5
2	Agree (S)	4
3	Neutral (N)	3
4	Disagree (TS)	2
5	Strongly Disagree (STS)	1

This Likert scale is used as an answer and measure of the respondent's perception of each statement or question made in the questionnaire. Respondents will choose one of five alternative answers that suits the respondent's situation. The statement items in the questionnaire are made based on indicators taken from the TOE Framework variables, namely technology, organization and environment, so that each question item can represent this research variable.

RESULTS AND DISCUSSION

The research results will cover hypothesis testing, which includes respondent characteristics, descriptive research data, instrument testing results, analysis prerequisite testing results and research hypothesis testing results.

Validity test

The validity test in this research was carried out by comparing the product moment correlation value (r-count) with the r-table value or significance value (p-value) with the level of significance (α) value, namely 0.05, then a decision was made according to the test criteria. The r-table value is obtained with the formulation r-table = r (α ; n-2) = r (0.05 ; 58-

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2) = r (0.05 ; 56) = 0.258 which can be searched for in the r distribution table. The results of the validity test for the variables technology (X1), organization (X2), environment (X3), and implementation (Y) can be seen in the processed table, as follows:

Table 2. Technology Validity Test Results (X1)

No.	Items	r-count	Sig.	r-table	Information
1	X1.1	0.659	0,000	0.258	Valid
2	X1.2	0.795	0,000	0.258	Valid
3	X1.3	0.744	0,000	0.258	Valid
4	X1.4	0.689	0,000	0.258	Valid
5	X1.5	0.744	0,000	0.258	Valid
6	X1.6	0.713	0,000	0.258	Valid
7	X1.7	0.653	0,000	0.258	Valid
8	X1.8	0.806	0,000	0.258	Valid
9	X1.9	0.789	0,000	0.258	Valid

Source: Data processing results, 2023

Table 3. Organizational Validity Test Results (X2)

No.	Items	r-count	Sig.	r-table	Information
1	X2.1	0.542	0,000	0.258	Valid
2	X2.2	0.653	0,000	0.258	Valid
3	X2.3	0.713	0,000	0.258	Valid
4	X2.4	0.596	0,000	0.258	Valid
5	X2.5	0.768	0,000	0.258	Valid
6	X2.6	0.739	0,000	0.258	Valid
7	X2.7	0.680	0,000	0.258	Valid
8	X2.8	0.651	0,000	0.258	Valid
9	X2.9	0.627	0,000	0.258	Valid

Source: Data processing results, 2023

Table 4. Environmental Validity Test Results (X3)

No.	Items	r-count	Sig.	r-table	Information
1	X3.1	0.690	0,000	0.258	Valid
2	X3.2	0.709	0,000	0.258	Valid
3	X3.3	0.869	0,000	0.258	Valid
4	X3.4	0.878	0,000	0.258	Valid

Source: Data processing results, 2023

Table 5. Implementation Validity Test Results (Y)

No.	Items	r-count	Sig.	r- table	Information
1	Y.1	0.722	0,000	0.258	Valid

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No.	Items	r-count	Sig.	r- table	Information
2	Y.2	0.772	0,000	0.258	Valid
3	Y.3	0.856	0,000	0.258	Valid
4	Y.4	0.906	0,000	0.258	Valid
5	Y.5	0.879	0,000	0.258	Valid
6	Y.6	0.853	0,000	0.258	Valid

Source: Data processing results, 2023

Reliability Test

The reliability test in this research was carried out by comparing the Cronbach's alpha value with 0.600, then a decision was made according to the test criteria. The results of the validity test for all variables in this study can be seen in table 6 below.

Table 6. Research Variable Reliability Test Results

No	Variable	Cronbach's Alpha	Information
1	Technology (X1)	0.775	Reliable
2	Organization (X2)	0.775	Reliable
3	Environment (X3)	0.810	Reliable
4	Application Implementation (Y)	0.805	Reliable

Source: Data processing results, 2022

Multiple Linear Regression Analysis

Multiple linear regression analysis was carried out to determine the causal relationship or influence of technology (X1), organization (X2) and environment (X3) on the implementation of project scheduling and tracking applications at CV. Emporio Architect (Y) assuming that there are no disturbing factors. Multiple linear regression analysis will show the magnitude and direction of the influence of each independent variable on the dependent variable. The results of the multiple linear regression analysis in this research can be seen in Table 7 below.

Table 7. Results of Multiple Linear Regression Analysis

No.	Description	B
1	(Constant)	23,549
2	Technology (X1)	-0.784
3	Organization (X2)	0.368
4	Environment (X3)	0.453

Source: Data processing results, 2023

Based on Table 7, a multiple linear regression equation model can be created, namely as follows.

$\hat{Y} = 23.549 - 0.784\ X1 + 0.368\ X2 + 0.453\ X3$

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Based on the multiple linear regression equation above, it can be seen the magnitude and direction of the influence of technology, organization and environment on the implementation of scheduling and project tracking applications at CV. Emporio Architect. The interpretation of the multiple linear regression equation above can be described as follows:

a. b0 value (constant) has a positive sign, namely 23.549, meaning that technology (X1), organization (X2) and environment (X3) have a value of 0 percent or have not changed.
b. The b1 value (regression coefficient The regression coefficient value for the technology variable (X1) is -0.784, meaning that technology has a negative effect on the application or implementation of scheduling and project tracking applications at CV. Emporio Architect (Y).
c. The b2 value (regression coefficient The regression coefficient value for the organizational variable (X2) is 0.368, meaning that the organization has a positive influence on the application or implementation of scheduling and project tracking applications at CV. Emporio Architect (Y).
d. The b3 value (regression coefficient The environmental variable regression coefficient value (X2) is 0.453, meaning that the environment has a positive influence on the application or implementation of project scheduling and tracking applications at CV. Emporio Architect (Y).

Simultaneous Hypothesis Testing (F-Test)

The F-test in this research was carried out by comparing the F-calculated value with the F-table value or significance value (p-value) with the level of significance (α) value, namely 0.05, then a decision was made according to the test criteria. The F-table value is obtained with the formulation F-table = F [α ; df1 (k-1) ; df2 (nk)] = F [0.05 ; df1 (4-1) ; df2 (58-4)] = F [0.05 ; df1 (3) ; df2 (54)] = 2.780 which can be looked up in the F distribution table.

It is known that the F-count value is 30.5767 and the significance value (p-value) is 0.000. These figures mean that technological (X1), organizational (X2) and environmental (X3) variables have a significant influence simultaneously on the implementation of project scheduling and tracking applications at CV. Emporio Architect (Y), because the F-calculated value is higher than the F-table value (30.767 > 2.780) and the significance value (p-value) is lower than 0.050 (0.000 < 0.050). To clarify these results, a picture of the area of rejection and acceptance of H0 is created as follows:

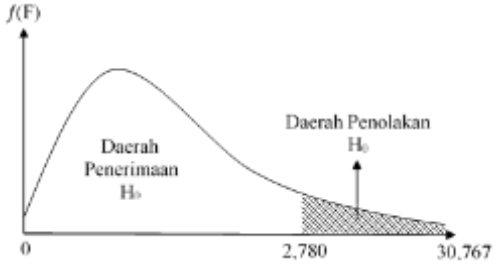

Figure 3. Simultaneous Hypothesis Testing

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https://ejournal.seaninstitute.or.id/index.php/InfoSains

Partial Hypothesis Test (t-test)

The t-test in this research was carried out by comparing the calculated t-value with the t-table value or significance value (p-value) with the level of significance (α) value, namely 0.05, then a decision was made according to the test criteria. The t-table value is obtained with the formulation t-table = t [α ; (nk)] = t [0.05 ; (58-4)] = t [0.05 ; (54)] = 2.004 which can be found in the t distribution table. The results of the t-test in this research can be seen in Table 8 below.

Table 8. Results of Multiple Linear Regression Analysis

No.	Description	t-count	Sig.
1	Technology (X1)	-5,070	0.001
2	Organization (X2)	1,462	0.002
3	Environment (X3)	2,381	0.820

Source: Data processing results, 2023

The following describes partial hypothesis testing (t-test) for each variable in this research.

a. T-test of the influence of technology (X1) on the implementation of project scheduling and tracking applications (Y). Based on Table 4.8, it can be seen that the t-calculated value of the technology variable (X1) is -5.070 and the significance value (p-value) is 0.000. These numbers mean that the technology variable (X1) can significantly influence other variables on the implementation of project scheduling and tracking applications at CV. Emporio Architect (Y), because the t-count value is lower than the t-table value (-3.516 < 2.004) and the significance value (p-value) is lower than 0.050 (0.000 < 0.050). The results of the t-test calculation for the technology variable obtained a t value of -5.070 with a p-value of 0.000 < 0.05, so Ho was rejected, meaning that technology had no significant effect on the application or implementation of the scheduling and project tracking application at CV. Emporio Architect (Y).
b. T-test of organizational influence (X2) on the implementation of project scheduling and tracking applications (Y). Based on Table 4.8, it can be seen that the t-calculated value of the organizational variable (X2) is 1.462 and the significance value (p-value) is 0.149. These numbers mean that the organizational variable (X2) can significantly influence other variables on the implementation of project scheduling and tracking applications at CV. Emporio Architect (Y), because the t-count value is lower than the t-table value (1.462 < 2.004) and the significance value (p-value) is higher than 0.050 (0.149 > 0.050). The results of the t-test calculation for organizational variables obtained a t value of 1.462 with a p-value of 0.149 > 0.05, so Ha was accepted, meaning that the organization had no significant influence on the application or implementation of the scheduling and project tracking application at CV. Emporio Architect (Y).

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c. T-test of environmental influence (X3) on the implementation of project scheduling and tracking applications (Y). Based on Table 4.8, it can be seen that the t-value of the environmental variable (X3) is 2.381 and the significance value (p-value) is 0.021. These figures mean that the environmental variable (X3) has a partially significant influence on the implementation of project scheduling and tracking applications at CV. Emporio Architect (Y), because the calculated t-value is higher than the t-table value (2.381 > 2.004) and the significance value (p-value) is lower than 0.050 (0.020 > 0.050). The results of the t-test calculation of environmental variables obtained a t value of 2.381 with a p-value of 0.020 > 0.050, so H0 was rejected, meaning that the environment had a significant influence on the application or implementation of scheduling and project tracking applications at CV. Emporio Architect (Y).

CONCLUSION

From the results of the analysis and hypothesis testing that has been carried out, several conclusions can be obtained, as follows: 1) The technology variable was identified as having a regression coefficient value of -0.784. The t-test results have a calculated t-value lower than the t-table value (-5.070 < 2.004), meaning that technology has no significant effect on the implementation of project scheduling and tracking applications at CV. Emporio Architect. The TCR results from the technology variable (X1) also explain that the computer indicator is in the bad category, the internet indicator is in the bad category and the application indicator is in the bad category. From the description above, it can be identified that technological factors, such as computers, the internet and applications actually have a significant influence on the implementation of an application. But what happened at CV. Emporio Architect is actually the opposite, so this has an impact on the implementation of scheduling and project tracking applications at CV. Emporio Architect. 2) It was identified that the organizational variable had a regression coefficient value of 0.368. The t-test results have a calculated t-value lower than the t-table value (1.462 < 2.004), meaning that the organization has no significant influence on the implementation of project scheduling and tracking applications at CV. Emporio Architect. The TCR results from the organizational variable (X2) also explain that the division indicators are in the adequate category and the management indicators are in the poor category. From the description above, it can be identified that organizational factors, such as divisions and company management, actually have a significant influence on the implementation of an application. But what happened at CV. Emporio Architect is actually the opposite, so this has an impact on the implementation of scheduling and project tracking applications at CV. Emporio Architect. 3) Environmental variables were identified as having a regression coefficient value of 0.453. The t-test results have a calculated t-value higher than the t-table value (2.381 < 2.004), meaning that the environment has a significant influence on the implementation of scheduling and project tracking applications at CV. Emporio Architect. The TCR results from the environmental variable (X3) also explain that competitor indicators are in the good category, customers/clients are in the good category and office

indicators are in the good category. From the description above, it can be identified that environmental factors, such as competitors, customers/clients and offices have a significant influence on application implementation.

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