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Knowledge Management Service Center System Using Chatbot

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Abstract

The use of knowledge management has become a common thing for business companies and continues to be developed in recent years. Knowledge management is suitable to be developed into various business lines of the company. The service center is the first place for organizational members to find explanations for their problems. The implementation of the chatbot into the knowledge management application that is built is intended to make it easier for members to find explanations for their problems. The application is built using the SECI model method in building chatbot-based knowledge management. In implementing this knowledge management application, it helps members to find explanations of their problems and significantly improve the performance of service center applications.

Keywords: *Knowledge management, SECI Model, Chatbot*

1. Introduction

Information technology and telecommunications are one of the fastest growing industries, this causes threats and opportunities for a company [1]. How a company can utilize Information and Telecommunications Technology is one of the keys to success for the progress of a company [2] .Technology when used properly can help companies to make time and energy efficiency [2] .Information is an important part of the company so it needs to be managed both information in the form of standard documentation of procedures and policies so that it can become knowledge that has business value [3], [4].

Knowledge Management System (KMS) helps the organization develop into a learning organization. This knowledge must be managed, must be planned and implemented [5] .Changes that occur inside and outside the organization require the organization to continuously learn and adapt, in order to be able to follow changes or be ahead of these changes in order to maintain themselves and not be left behind in the turmoil of change [6] .The technology used must support the conditions of the company [2] .In performing the efficiency of time and energy from the company, the technology used requires technology that can provide information quickly and accurately [7].

Often service centers within a company become part of companies that need to take information quickly and accurately in helping other parts of the company [8]. The service center is intended to always be available if there are problems faced by other parts. In this case the service center requires a lot of human resources to be able to work fully. Technology is expected to help their work become easier. By using chatbot technology, other parts of the company can communicate first with chatbots that have been provided before being handled by the service center. In addition, the knowledge management system using chatbots makes other parts of the company able to solve their own problems without the help of the service center. This research will build a Knowledge Management System based chatbot that can handle the same issues that go into parts Service center with SECI Model approach.

2. Literature Review

2.1 Information

Information is a data that has been processed into a form that has meaning for the recipient and has real and perceived value for the current decision or future decision [9]. Data is a source of information. Data is a reality that describes a real event and event [9]. Information processing is a

principal activity in forming a record, finding and retrieving information. In good information processing, it can provide strength, generate insight, and provide competitive advantage [10]. In successful information processing, the key is trust between the giver and recipient of information and willingness to share [11]. Knowledge is an information that is the result of data processing.

2.2 Knowledge Management

The concept of knowledge management was first developed by Nonaka in the 1990s [12]. The basis of knowledge management is the transfer of knowledge with two types, explicit and tacit [13]. Knowledge management is a technique used in storing, sending, maintaining, and managing information in an organization [14], [15]. Knowledge management is a strategic process not just an organization and processing of transactional data in a company [16].

Knowledge management is the process of capturing, managing, effectively using knowledge [17] .Knowledge management can also be used to analyze external circumstances to produce data that can be used to build new information that can be used by companies [18]. Knowledge management has an important effect on system development in almost all areas of the company and knowledge management has a positive impact on the business of the company [19]. In increasing competitiveness within the company, innovative knowledge management needs to be considered and implemented into a company [20], [21]. Knowledge management can be used to be a link between software development and the use of software in business needs [22]. Knowledge management can be concluded is a new understanding that can be used to build technology in a business to be able to strengthen the business in the future [23].

2.3 SECI Model

SECI model is a dynamic theory of knowledge proposed by Nonaka and Takeuchi [16]. SECI model is the process of knowledge formation using tacit and explicit [24], [25]. SECI Model consists of several methods that can support knowledge management, namely, socialization, externalization, combination, and internalization [26], [27]. The description in the SECI model can be seen as follows:

2.3.1 Socialization

Process transfer of knowledge from one individual to another or the environment directly. This socialization phase can be more effective if using scheduling for knowledge transfer processes such as training, discussions, meetings or field activities [27], [28].

2.3.2 Externalization

The process of translating instinct experiences or analytical skills into more tangible forms such as reports, writings, books, digital data, concepts or prototypes.IT features that can be used for this activity can be in the form of wikis, blogs and asynchronous tools (discussion forums, email or mailing lists) [27], [28].

2.3.3 Combination

The process of creating, collecting and managing actualized knowledge such as reports, writings, books, research results or questionnaires becomes a media that is compiled systematically (knowledge base). At this stage a classification method is needed, so that the relationship between documents (taxonomy) is formed. The concept of RDF (resource definition framework) is one method for classifying documents used in this study [27], [28].

2.3.4 Internalization

The process of absorbing knowledge from various literatures and trying it in everyday life or often called learning-by-doing. The result of this process is the formation of experiences, ideas or concepts from the results of the experiments carried out. The new knowledge formation stage is in accordance with the CBR concept (case base reasoning) where a solution to a new case will form when we use the previous several cases [27], [28].

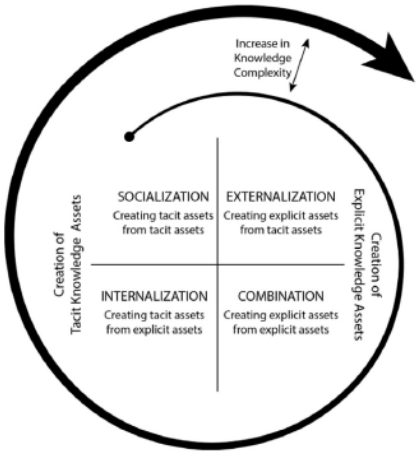

Figure 1: SECI Model of Dynamic Knowledge Creation

3. Results And Discussion

3.1 Types of Research

The type of research in this study uses experimental and quantitative models. The experimental model is a research model that is test, influence, and manipulate things related to all variables or related attributes. This experimental research aims to build a Service Center Application with a SECI-based Chatbot approach.

Quantitative model where the researcher tests the hypothesis with statistical techniques. These statistical data were obtained from the questionnaire by using path analysis to test the usability of the applications built.

3.2 Discussion

Knowledge Management (KM) can also be defined as a set of people, processes and tools (technology) interventions to support the process of making, mixing, storing and disseminating knowledge. Where the process of making knowledge is a process of improvement of existing knowledge through the process of experience, where this process usually occurs when there is error detection and repair.

New knowledge arises because of a continuous interaction between explicit knowledge (actualized) and tacit (hidden). Actualized knowledge is a form of knowledge that has been documented or formalized, easily stored, reproduced, disseminated and studied. such as manuals, books, reports, documents, letters and so on. Whereas hidden knowledge is a form of knowledge that is still stored in the human mind, such as ideas, perceptions, ways of thinking, insights, skills / skills, and so on.

The continuous interaction includes four stages:

- socialization
- externalization (hidden-to-actualized)
- combination (actualized-to-actualized)
- internalization (actualized-to-pent).

This interaction is used as a model called SECI Model [17].

Description of SECI model usage on chatbot based knowledge management system applications.

3.2.1 Socialization

Knowledge management applications based on chatbots that are built have several processes of transfer of knowledge from one individual to another. Certain users also have the authority to provide input or responses to the explanations that exist in the knowledge management system. This provides space for users to be able to provide their knowledge to other users.

The chatbot feature will ask the user to fill in the feedback for the chosen explanation option to be able to provide feedback to other users who will use the explanation.

3.2.2 Externalization

The knowledge management application that was built contained a feature that gathered all explanations of the problems that were successfully overcome and documented. This feature allows the user to see in the browser that is used or download the settlement of the search method that is searched in pdf format.

The chatbot feature will provide several choices from the existing explanation based on the input entered by the user into the system. From the selection of explanations chosen by the user, the system will continue into the tips feature of the explanation.

3.2.3 Combination

Knowledge management applications that are built have tips. This feature allows users who have the authority to be able to make an explanation documentation for tips that other users can use for the problems at hand. This feature classifies several explanations into several groups of tips that allow users to search for explanations based on the group of tips available. This feature also has a way to create, edit, or delete for changes to tips in the future.

The chatbot feature that asks users to enter feedback on the selected tips, can be a reference for users who make these tips to be able to update existing tips or create new tips from feedback entered by the user.

3.2.4 Internalization

Knowledge management applications that are built have features to store user feedback that can be used to determine the tips provided by the chatbot feature for keywords entered by the user. With this feature, it is expected that the results of giving tips provided by chatbot will be more accurate with user feedback on keywords entered by the user. This concept is based on the learning-by-doing concept to accurately data from the chatbot feature.

3.3 System Implementation

After the Chat Center-based Service Center application has been implemented, the next step is the application of the application to the object of the research, which is testing the application carried out by several admin and several user employees as users.

Admin is responsible for adding a list of tips and choosing feedback from users. User users are tasked with finding explanation tips using the chatbot feature in the system.

The following is a description of the features in the chatbot-based service management center system

3.3.1 Login Feature

In this feature the user is asked to enter the User ID and Password which will then be authenticated by the application. This feature as a security to ensure that you can enter the application is the authorized one.

3.3.2 Tips Feature

In the tips feature here is the intended combination process for knowledge management. This feature can manipulate information data such as create, read, update, delete tips.

3.3.3 FAQ Feature

In this feature an internalization process is applied where the system can help provide solutions about what is being sought by users. With this feature, users can search for information that is being asked by other users in a certain period.

This feature is added. On the Latest Tips page is a socialization process wherein the transfer of knowledge between users regarding the latest tips or tips can be given comments or responses from other users.

3.3.4 Download Feature

This feature applies the externalization of tacit to explicit knowledge transfer such as downloading. With this feature, users can easily access the explanations that are searched for and stored on the local computer for future use. The results provided by the system for this download feature are in the form of pdf.

3.3.5 Chatbot Page

In this feature a function is used for the user to communicate with the system to record questions or input from the user. The system will provide a choice of several existing tips by matching the keywords entered by the user. Users can choose from several available tips.

After the user finds the tips that are in accordance with the data input, the user is asked to provide feedback related to the choices chosen. If the user chooses the choice according to the user's expectations, the system will record the data input from the user and the choice of tips to be the criteria for giving answers to other users.

3.3.6 System Test

Application testing Knowledge Management System Service Center with the SECI approach. The model built will be carried out in two stages, namely: Testing blackboxes against functions that support the SECI Model process.

The results of testing blackboxes for functions that support the Lesson Learned process can be seen in the following table.

Table 1: Blackbox

No	Functions	Expected Result	Result
1	Socialization	Is there feedback or communication?	Valid
2	Externalization	There is a tacit knowledge transfer feature to explicit like downloading?	Valid
3	Combination	There is documentation and management of knowledge?	Valid
4	Internalization	Is there data storage in the system?	Valid

3.3.7 Usability

In this usability test, we will see the effect of communicativeness, operability, and usability training variables using SPSS 17.0 path analysis and application methods. Departing from the existing theory, a hypothesized model is made. The hypothesis in this test based on the variables studied are:

H0: variable communicativeness, operability, and training have no effect on usability either in combination or partially.

H1: variable communicativeness, operability, and training have no effect on usability either in combination or partially.

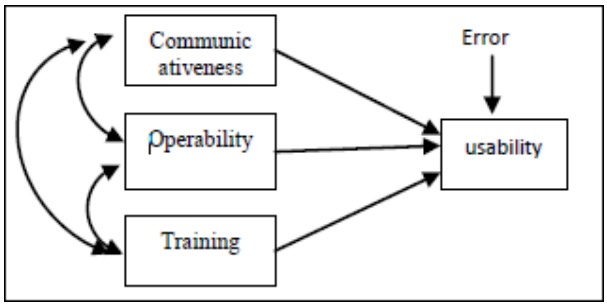

Figure 1: Path Analysis

The conclusions obtained from the results of this path analysis are as follows:

1. The level of communication (exogenous communicativeness variable) partially has a significant effect on service satisfaction (endogenous usability variable) of 0.17 or 17%.

2. The ease of operation (exogenous variable operability) partially influences and significantly affects service satisfaction (endogenous usability variable) of 0.294 or 2.94%.

3. The ease of learning facilities (exogenous variables training) partially has a significant effect on service satisfaction (endogenous usability variables) of 0.532 or 53.2%.

4. The effect of exogenous variables on communicativeness, operability, and training in combination with endogenous usability variables was 0.858 or 85.8%.

5. The influence of other variables outside this model is 0.163 or 16.3%.

6. The correlation between the variables communicativeness and operability is sufficient and unidirectional is 0.784.

7. The correlation between communicativeness and training variables is sufficient and unidirectional is 0.746.

8. The correlation between operability and training variables is strong and unidirectional at 0.847.

9. Regression models that have been made are feasible / correct with sig values. equal to 0,000.

10. The three exogenous variables used as predictors are appropriate, with the standard error of estimates value of 0.3536 <standard deviation value of 0.9235 (communicativeness), 0.9279 (operability), and 0.8573 (training).

11. The three variables have a significant beta coefficient, namely the communicativeness variable of 0.016, operability of 0.001, and training of 0.000.

12. There is no autocorrelation in the multiple regression model that has been made with the Durbin-Watson value of 1.632.

13. There is no multicollinearity between exogenous variables used in the regression model above with correlation values between communicativeness and operability variables of 0.786, between communicativeness and training variables of 0.745, and between operability and training variables of 0.837.

14. Linearity in the regression model has been fulfilled because the data has formed a straight line from the lower left side to the upper right in accordance with the linearity theory.

Data is normally distributed because even though it is imperfect, the data used tends to form a bell curve.

To ensure that KMS applications that are made have a minimum quality standard, one method for measuring software quality quantitatively is the SQA (Software Quality Assurance) method.

There are 8 criteria that can be used to quantify the quality of a software quantitatively where the metric size is divided into 8

a. Auditability.
b. Accuracy.
c. Completeness.
d. Error Tolerance.
e. Execution Efficiency.
f. Operability.
g. Simplicity.
h. Training.

The following are the results of calculations based on the value of 8 expert respondents, using the SQA formula, Score = <Auditability Score> * 0.125 + <Accuracy Score> * 0.125 + <Score Completeness> * 0.125 + <ScoreTolerance> * 0.125 + <ScoreExecutionEfficiency> * 0.125 + <Performance Score > * 0.125 + <Implicity score> * 0.125 + <ScoreTraining> * 0.125

Of the 8 existing criteria, not all are used for score metrics, the following is a metric table that is calculated to get the SQA score

Table 2: Metric of Software Quality Assurance (SQA)

No	Metric	Description	Weight
1	Accuracy	Computational Accuracy	0.125
2	Operability	Ease of operation	0.125
3	Simplicity	Easy to understand	0.125
4	Training	Ease of learning facilities	0.125

After surveying 12 expert respondents, the average score produced was 81.40 as in the table below, while the optimal value for a software that meets quality standards based on the SQA test is 80.

Table 3: Evaluation Results

User	Metric Score				Score
	1	2	3	4	
1	76	78	77	76	76.75
2	83	85	88	89	86.25
3	80	85	81	82	82
4	73	77	74	74	74.5
5	70	78	73	72	73.25

6	85	89	88	86	87
7	87	89	87	87	87.5
8	75	79	78	77	77.25
9	77	81	78	79	78.75
10	81	85	84	82	83
11	85	88	86	86	86.25
12	83	86	84	84	84.25
Average					81.40

4 Conclusion

From the results of the research conducted there are some conclusions as follows:

a. Application in Service Center with SECI approach Model based on chatbot can be applied properly as an alternative medium of the system that is already running.

b. Communicativeness, operability, training have a significant effect on usability.

c. Service Center applications with the SECI Model approach based on chatbots have met SQA standards.

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