Critical Success Factor Information System Model

Inayatulloh, Meyliana, Achmad Nizar Hidayanto, Harjanto Prabowo

Abstract: The successful application of knowledge management as information system is determined by many factors where these factors are a component or part of knowledge management. The success of developing knowledge management will depend on these important factors. So far the knowledge system model that was built is only based on the main part without looking at the important parts of the model. This research aims to build a information system model based on factors of critical success. The identification of the critical success factors was sourced from 51 articles with a time span between 2006 and 2019. The results of this paper are a collection of several factors that determine the success of building an information management system. The most critical factor for information management systems is management support and organizational culture. Future research will continue research on strategies for implementing information management systems.

Keywords: CSF, SLR, KMS.

I. INTRODUCTION

The success of a business can be supported by many factors, one of which is knowledge. As with other company assets, information must be treated systematically which then becomes a knowledge management as information system. In other words Information Management is defined as a series of activities to realize tangible and intangible knowledge assets that are systematically structured to produce the creation of new information and innovation [1].

The implementation of a management information system will succeed if the company can identify the cause that determine the great implementation of the information management system. By knowing what components or factors are needed for building an information management system, the company will be able to prepare it so that the process of building an information management system can run well.

Yen-Ching Ou Yang et al. [2] conducted a systematic literature review of CSF KM that only produces CSF without looking at which industries were analyzed because there could be differences in their application in different industries. While Muhammad et al conducted a systematic literature review study to answer research question trends, issues and challenge from the Information Management System.

This research has purpose is to analyze using complete and systematic literature and will show that there is renewal. This research has a Research Question "What factors determine the success of the Knowledge System development?"

While this research aims: to find factor has impact in the success of building a System of Knowledge Management and develop model critical success factor for information system. This research has the hope to be able to produce conclusions determining factors for the successful implementation of Information System..

II. LITERATURE STUDY

A. Critical Success Factor

One of the originators of the term CSF was Daniel [3]. His thoughts set forth in a sentence that there are certain the cause that will affect the company success, if the company does not have these factors then the company fails. Another understanding of the definition of CSF is the success of competitive organization.. Digman[4] defines CSF with the minimum factors that must be possessed by the organization in order to excel in competition which is also successful in achieving company goals.

B. Knowledge Management

The competitive advantage of an organization today is largely determined by how much knowledge it has. Good knowledge ownership will greatly affect the overall performance of the company. Good knowledge management will continue to produce new findings and continuous innovation which will further enhance the company's business processes. Since 1990 academics and practitioners have done a lot of research related to knowledge as a new force [5]. At that time the view of knowledge was an asset that was never obsolete and did not depreciate like other company assets. The future of knowledge will explore with four approaches namely practical management, computer technology, development and adoption.
III. METHODOLOGY OF RESEARCH

Research is carried out through a number of steps in the following sequence: first, determining the research question as stated at the beginning. The second step is to determine the sources used to find answer the RQ. The next step is to determine keywords to find the required information followed by extracting data. The final step is to carry out an analysis process to answer the research question.

The first process is the search for articles by referring to several sources namely: IEEEXplore Digital Library (http://ieeexplore.ieee.org), Sciences Direct (www.sciencedirect.com), Wiley by Online Library (onlinelibrary.wiley.com), Inderscience (www.emeraldsight.com) and Springer Link (link.springer.com). Choosing the right keywords will produce a collection of articles that have a relationship with the research question. Then the keywords used are 'critical success factor' or 'csf', Knowledge management as information system or Knowledge Management System'. The detailed information result provide in Table 1.

The next step is to group the findings from the search process that has been done. All articles generated based on keywords are called 'articles found'. Then the next step is to look at the relevance of the research question based on the title of the article found and then group it into candidate articles. The final step is to identify candidate articles through their abstracts which will later be analyzed in more detail into selected articles. September 2019 research began with the findings of 270 papers from the results of previous research. Of the 270 findings were selected again into 106 candidate articles based on the similarity of the research title and the final selection by looking at the contents of the paper found 55 results of previous research to be studied deeper.

IV. RESULT AND DISCUSSION

1. Grouping based on journals and conferences

Table 2

<table>
<thead>
<tr>
<th>Source</th>
<th>Found article</th>
<th>Candidate Article</th>
<th>Choose Article</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIS</td>
<td>9</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Ieee</td>
<td>60</td>
<td>50</td>
<td>32</td>
</tr>
<tr>
<td>Emeralds</td>
<td>45</td>
<td>12</td>
<td>5</td>
</tr>
</tbody>
</table>

The detailed information result provide in Table 1.
There are only a few authors, Arfan Arshad, Andrea J. Hester, Alok Kumar, Alberto Un Jan, Achmad Yudho, Murray E. Jennex, produced articles about knowledge management as information system. The success of KM System is assessed from the perspective of context of social, the component in the external model receive influences from: External awards, internal awards, and organizations that provide trust.

### 2. Paper classification by country

<table>
<thead>
<tr>
<th>Country</th>
<th>Article</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>7</td>
<td>13.7%</td>
</tr>
<tr>
<td>China</td>
<td>7</td>
<td>13.7%</td>
</tr>
<tr>
<td>Taiwan</td>
<td>7</td>
<td>13.7%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>6</td>
<td>11.8%</td>
</tr>
<tr>
<td>Iran</td>
<td>3</td>
<td>5.9%</td>
</tr>
<tr>
<td>Korea</td>
<td>3</td>
<td>5.9%</td>
</tr>
<tr>
<td>German</td>
<td>3</td>
<td>5.9%</td>
</tr>
<tr>
<td>USA</td>
<td>3</td>
<td>5.9%</td>
</tr>
<tr>
<td>Russia</td>
<td>2</td>
<td>3.9%</td>
</tr>
<tr>
<td>Germany</td>
<td>2</td>
<td>3.9%</td>
</tr>
<tr>
<td>Peru</td>
<td>1</td>
<td>2.0%</td>
</tr>
<tr>
<td>New Zealand</td>
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<td>2.0%</td>
</tr>
<tr>
<td>Hongkong</td>
<td>1</td>
<td>2.0%</td>
</tr>
<tr>
<td>Ukraine</td>
<td>1</td>
<td>2.0%</td>
</tr>
<tr>
<td>Brazil</td>
<td>1</td>
<td>2.0%</td>
</tr>
<tr>
<td>Germany</td>
<td>1</td>
<td>2.0%</td>
</tr>
<tr>
<td>India</td>
<td>1</td>
<td>2.0%</td>
</tr>
<tr>
<td>Thailand</td>
<td>1</td>
<td>2.0%</td>
</tr>
<tr>
<td>Total</td>
<td>51</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Table 3 illustrates that knowledge management as information system are widely applied in various types of industries meaning that application of knowledge management as information system is general industry in nature that can be used in several different types of industries.

### 3. Classification based on type of industry

<table>
<thead>
<tr>
<th>Industry</th>
<th>Article</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>16</td>
<td>31.4%</td>
</tr>
<tr>
<td>Education</td>
<td>7</td>
<td>13.7%</td>
</tr>
<tr>
<td>Government</td>
<td>6</td>
<td>11.8%</td>
</tr>
<tr>
<td>Healthcare</td>
<td>4</td>
<td>7.8%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>4</td>
<td>7.8%</td>
</tr>
<tr>
<td>SMEs</td>
<td>3</td>
<td>5.9%</td>
</tr>
<tr>
<td>Hospitality</td>
<td>2</td>
<td>3.9%</td>
</tr>
<tr>
<td>Service industry</td>
<td>2</td>
<td>3.9%</td>
</tr>
<tr>
<td>Finance</td>
<td>1</td>
<td>2.0%</td>
</tr>
<tr>
<td>Construction</td>
<td>1</td>
<td>2.0%</td>
</tr>
<tr>
<td>ICT</td>
<td>1</td>
<td>2.0%</td>
</tr>
<tr>
<td>Pharmaceutical</td>
<td>1</td>
<td>2.0%</td>
</tr>
<tr>
<td>Public sector</td>
<td>1</td>
<td>2.0%</td>
</tr>
<tr>
<td>Temporary organization</td>
<td>1</td>
<td>2.0%</td>
</tr>
<tr>
<td>Banking</td>
<td>1</td>
<td>2.0%</td>
</tr>
<tr>
<td>Total</td>
<td>51</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

From table 5 above, most authors only write 1 article related to knowledge management system. There are only a few authors who wrote 2 papers about knowledge management system.

5. Critical Success Factor KMS

- The Knowledge Management System success factors are: developing a culture of knowledge-friendly in corporate, knowledge and business processes become one processes, support by top leader, teamwork support for knowledge sharing, promoting activity for sharing knowledge and using the knowledge. Communicating of organizational knowledge is very important and important requirement of the employee’s work in organization. Formally when employee make knowledge sharing give them with rewards, Having a division that responsible for the KM, organization have to the place that provided information, The organization must have the tools of a KM to manage knowledge management (information technology infrastructure), the organization must be able to identify and motivate employees to be able to solve newly discovered problems. (Abd-Elaziz,2012)
- Documents Library and Blog, Forum of Discussion, Base of Knowledge, and Help desk are a requirement for Knowledge Management System success (Achmad, 2016)
- The successful of a KM System is measured by seeing the perceived output quality (the user is easy to use and the information produced must be quality), easy to do tracing and customer satisfaction because of the resulting benefits. When viewed from social factors, the success of KM System is assessed from the perspective of context of social, the component in the external model receive influences from: External awards, internal awards, and organizations that provide trust. (Alberto, 2016)
- The success of KMS can be created by motivating
workers to improve their knowledge by building a culture of sharing knowledge in the company. (Alok, 2010)

- The main factor for the success of Knowledge Management System must be approval from management to share knowledge. Sharing knowledge will bring benefits to the organization. although the company has organized knowledge if it does not get approval from management, organized knowledge does not produce profit for the company. (Andrea, 2010)

- Information linkages, when organizations need information, available and accurate information are some of the key factors have impact in the success of HCIS or Knowledge Management System (Arfan, 2018)

- Knowledge Management System success depends on communication between employees and their fellow interactions, learning, environment of the organizational and they culture, relationships between employee and motivation from top management, knowledge & sharing opportunities. (Augustina, 2016)

- Knowledge Management System is successful if SMEs comply with recommended guidance and direction and are committed to following instructions from top management. Smes also has quality human resources and provides a process of developing knowledge and continuously striving to improve their knowledge.. (Bertram Tan, 2006)

- Knowledge Management System implementation will be successful if the organization can integrate well with KMS infrastructure and knowledge creation process. The factor influencing success of KMS is the technology used because it will affect the knowledge distribution process. Furthermore, other factors that influence the successful implementation of KMS are culture and company structure. (Maria, 2011)

- Knowledge Management System on SMEs is influenced by their compliance following the specified stages. The second Knowledge Management System must have a commitment to always increase their knowledge and get support from management, especially top management. The third is that SMEs must have quality human resources. And finally the UK must have the media to be able to improve their knowledge and performance. (Bertram, 2006)

- The success of KMS depend on knowledge sharing and acquisition. (Class, 2014)

- The success of KMS depend on acquisition process, finishing knowledge, storage knowledge, sharing and application of KMS and finally innovation of create knowledge. (Dang, 2011)

- The success of Knowledge Management System depend on Leadership of Knowledge-preneur, Technology and entrepreneur Harmony, K-Partnership of Organizational, Knowledge-preneur Employee and lastly, Palisade of Socialization. (Didi, 2019)

- The success of Knowledge Management System depend on teamwork and network, organization environment and monitoring & evaluation by top management, opportunity to create knowledge, innovation as creativity to improvement, allocation budget and change structure management, goodwill organization and corporate integrity. (Elin, 2015)

- Research by Fadli the variable has impact: Combination process and Socialization process of conversion knowledge, Creation of knowledge, Structure of Organization, KM repository, Knowledge on Common, IT and knowledge c, Physical of knowledge Environment, Externalization, Culture of Organization. (Fadli, 2017)

- The success of KMS can be created by Culture of organization and leadership of management and Organization, processes of Information and Communication Technology systems. (Frank, 2017)

- The success of KMS can be produced by mapping on internal knowledge. (Gangcheol, 2011)

- The success of KMS can be created by creating trust of organizational. The second employees who share knowledge will be given implied awards facilitating implicit rewards for knowledge contributions. Then explicit awards are implemented wisely. Finally Knowledge Management System is designed with a high level of search convenience. (Gee-Woo Bock, 2006)

- The success of KMS can be created by creation of knowledge or acquisition, validation of knowledge, storage of knowledge organization, distribution of knowledge and application knowledge. (Gustavo, 2016)

- The success of KMS can be created by 3 sub-processes that a source of knowledge should implement: knowledge identification, transformation of knowledge and filtering knowledge, and 2 sub-processes that the destination of knowledge have to implement, namely, acquisition of knowledge and knowledge application. (Hasniza, 2018)

- The success of KMS can be created by support of top managerial level, culture of knowledge sharing, motivation of knowledge sharing, education and training, connectivity of knowledge, filtering of knowledge and evaluation, turnover of staff, integration of IT infrastructure, and voice of customer. (Hyun Kang, 2011)

- If the principal has low knowledge then the development of Knowledge Management System will be difficult to implement. furthermore the principal has a strong level of knowledge will be successfully implemented and KMS will produce good performance. (Kai-wing Chu, 2016)

- Knowledge of values and competencies is a factor that has significance in the results of Knowledge Management System project and program implementation. (Kutsenko, 2018)

- The success of KMS can be created by first: Knowledge is generated from employee contributions. the Second: the source of knowledge is obtained from work processes and information technology. Third: knowledge storage is provided to facilitate the search for needed knowledge. Fourth: corporate knowledge includes knowledge and what kind of knowledge to create. (Lena, 2010)

- Knowledge Management System can succeed if Knowledge Management System has full support from top management. (Lu Xu, 2011)

- Knowledge Management System success is determined
by a culture of mutual understanding and respect, emotional closeness, cooperation, mutual trust building between stakeholders.(Ma Yan,2010)

- The determining cause for the success of Knowledge Management System is to create a concrete alignment between the goals of the organization and the vision and values that support the business development of the company or organization. Then social norms and social norms that exist. Lastly the availability of information and the culture of sharing knowledge in organizations. (Mohammad,2013)

- The success of KMS is influenced by the ease of acquiring knowledge, storage process and the process of acquiring knowledge.(Zali,2013)

- Knowledge Management System is successful if Knowledge Management System has a clear mission and vision. After having a clear vision and mission the organization must determine the type of important knowledge that must be owned by the organization. The next step is to identify stakeholders who have important knowledge for the company. Therefore final step is to prepare some knowledge structures for the company.(Mong yuan,2009)

- The success of Knowledge Management System is assessed from the results or its effect on company performance.(Muray,2012)

- Knowledge Management System will succeed if the organization has a solid strategy. Another factor influencing the success of KMS is the support of management or leadership. The final factor influencing the success of Knowledge Management System is the content of the knowledge needed by the organization.(Muray,2016)

- factors that impact the success of KMS are the culture of sharing knowledge in the organization and the availability of activities that produce knowledge.(Velasquez,2009)

- The success of KMS can be created by senior management support and Leadership, culture of Organization, technology of information.(Negin,2015)

- The important factor of Knowledge Management System is Knowledge sharing (KNOWLEDGE SYSTEM).(Nwakego,2012)

- We can identified effective KM environments of project can be traced back to 4 categories: cultural of sharing knowledge, structure of organization, and aspects related process aspects.(Frey,2009)

- Knowledge Management System success because it involves organizational culture in the development of Knowledge Management System, provides a system that supports KMS and the activity of documenting knowledge into knowledge storage media.(Peyman,2017)

- The success of KMS can be created by training and education, management of human resource, support of top management, and culture of organizational.(Pinkie, 2013)

- adaptation of knowledge has a important effect on departmental position and The success of Knowledge Management System.(Shih-Yu,2018)

- Knowledge Management System success in hospitals is determined by high agreement between doctors and managers of hospital. Political intervention can have an important effect on the adoption process and implementation of Knowledge Management System. Second, the full support of doctors in the organization and implementation of knowledge Management System (shofang,2012)

- The success of KMS can be created by structure of Base of Knowledge, strategy of Business, activities of Knowledge management.(shu-hui,2011)

- The success of Knowledge Management system can be created by commitment of stakeholder, awareness strategy, company culture, people, and structure of knowledge and information technology. (Siti, 2014)

- The success of KMS can be created by the availability of knowledge generated from information and knowledge about customers, competitors and technology.(Stanley,2012).

- The success factors Knowledge Management System are organization support and Training ; development and external expertise.(Stewart, 2012)

- The success factors Knowledge Management System are ontology, network, production, imperative and sub definite.(Bova, 2014)

- Several studies have shown that the factors that can maintain the success of Knowledge Management System are commitment from top management, encouraging the creation of high quality knowledge and the dissemination of knowledge use (Vincent, 2014)

- The success of KMS can be created by the Rule-based Knowledge Acquisition, the Medical Knowledge Base, the User Interface Unit. (Watcharacai,2018)

6. Summary Critical Success Factor based on literature review

<table>
<thead>
<tr>
<th>CSF</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor of Knowledge creation</td>
<td>31</td>
</tr>
<tr>
<td>Factor of Organization Environment</td>
<td>24</td>
</tr>
<tr>
<td>Factor of Knowledge application</td>
<td>20</td>
</tr>
<tr>
<td>Factor of Knowledge storage</td>
<td>14</td>
</tr>
<tr>
<td>Factor Culture of the organizational</td>
<td>14</td>
</tr>
<tr>
<td>Factor supports of Management</td>
<td>13</td>
</tr>
<tr>
<td>Factor of Knowledge sharing</td>
<td>7</td>
</tr>
<tr>
<td>Factor of Knowledge structures</td>
<td>6</td>
</tr>
<tr>
<td>Factor of Knowledge Training</td>
<td>6</td>
</tr>
<tr>
<td>Factor of Knowledge infrastructure</td>
<td>6</td>
</tr>
<tr>
<td>Factor of Employee motivation</td>
<td>6</td>
</tr>
<tr>
<td>Factor of Management leadership</td>
<td>4</td>
</tr>
<tr>
<td>Factor of Knowledge convenience</td>
<td>2</td>
</tr>
<tr>
<td>Factor of Knowledge awards</td>
<td>1</td>
</tr>
<tr>
<td>Factor of Knowledge strategy</td>
<td>1</td>
</tr>
</tbody>
</table>
Critical Success Factor Information System Model

Based on the literature review the first most important factor is knowledge creation which has the same meaning as knowledge capture, knowledge process, knowledge innovation, knowledge development, knowledge.

This finding shows that the existence of knowledge in the company is an initial step success to do the next activity Related to knowledge management as information system. Further activities of the knowledge management system such as the creation of knowledge applications will not be able to be built if the required knowledge as the main basic material is not available. The culture of sharing knowledge within a company is very important but if the knowledge to be shared does not exist then knowledge sharing cannot be done. Likewise, management support for KMS is very important but if knowledge is not available then management support is meaningless.

V. DISCUSSION

The results of the analysis of the literature above, the SCF knowledge system model based on literature review is generated as shown in Figure 2. Kms consists of 3 main parts, namely

a. Infrastructure: technology, structure, culture, people, Leadership
b. Process: Creation, conversion, application, protection, sharing, Training
c. Strategy: Support, awards dan training.

<table>
<thead>
<tr>
<th>Part of Model</th>
<th>Advice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model based on CSF Literature review</td>
<td>There are some findings in the literature review that are not present in the model. If there is a common understanding, for example, knowledge creation is the same as knowledge acquisition and so on, it is necessary to add a section that explains it.</td>
</tr>
<tr>
<td>KNOWLEDGE SYSTEM is divided into 3 parts, namely infrastructure, process and strategy</td>
<td>The division of KNOWLEDGE SYSTEM into 3 main parts needs to be given an explanation or reasons for the division so that the grouping has good reasons</td>
</tr>
<tr>
<td>Training is part of the strategy</td>
<td>Why is training included in the strategy? Give a strong reason so that the grouping can be justified</td>
</tr>
</tbody>
</table>

VII. CONCLUSION

The model created is a model that was adopted from several knowledge systems that have been used in several institutions. This model is a development of the previous SS model which only consists of 2 or 3 parts only where the main part is no longer divided into smaller subdivisions.

The knowledge system model that was made is also based on the success factor of the knowledge system implementation, so this component of the model is very significant for the success of the knowledge system.

VIII. LIMITATION

This research is limited to the number of articles collected and analyzed. By increasing the number of articles based on a wider range of time the results obtained will be better

ACKNOWLEDGMENT

The researcher is grateful for the guidance and direction from the previous researcher. Their findings greatly helped the authors answer the research question.

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