The Critical Success Factors of Knowledge Repository: A Proposed Framework

Norfatin Farhanah Zamani and Tengku Adil Tengku Izhar

Faculty of Information Management, Universiti Teknologi MARA UiTM, Puncak Perdana Campus, UiTM Selangor, Malaysia

Abstract: Knowledge repository is a computerized system that maintains various digital resources to be accessed by the users electronically. Critical success factor on the other hand is defined as the crucial elements that contribute to the success of an event or organization. This paper reviews the literatures on the contributing factors of knowledge repository implementation among the users which specifically focus on the content coverage, technological function and promotion of knowledge repository besides discussing on the proposed models on the critical success factors of knowledge repository by previous researchers too. Finally, this study is aiming to propose a framework on the critical success factors of knowledge repository. This study is significant to the top management and employees of an organization for improving the knowledge repository service in the organization which may act as an effective tool towards the enhancement of the organization performance.

Keywords: Content Coverage, Critical Success Factors, Knowledge Repository, Promotion, Technological Function

Introduction

Due to the rapid advancement of sophisticated technology in the world nowadays, people tend to maximise or fully make use of the technology as an effective tool in facilitating their tasks efficiently. So do the implementation or utilization of knowledge repository which enables the users to work not only easier but also faster in terms of helping them in retrieving their needed resources systematically. In order to cope with the recent and rapid advancement of technology today so that people will not left behind the others, the implementation or utilization of knowledge repository especially among the academicians and practitioners is actually crucial in assisting their tasks efficiently. This is because the knowledge repository acts as a tool to preserve the organization's academic output for long period of time (Westell, 2006). Knowledge repository is indeed one of many effective knowledge management tools that help a lot in engaging people with valuable resources by easily and promptly exposing and serving them to variety of reliable knowledge through various provision of digital resources which are available for anytime of access. The practices of repositories contribute to the improvement in all aspects of experience-based process

(Schneider & von Hunnius, 2003). Therefore, what is actually knowledge repository? Knowledge or institutional repository is as a digital scholarly work collection that reflect the institution or university intellectual asset and available to be accessed electronically (Westell, 2006). Due to all of these benefits that the knowledge repository can ever offer, it is important to encourage the utilization of it among the communities in order to facilitate their research or even their daily routine tasks.

This is where a vital transformation from a traditional practice of printed or physical materials to the electronic or digital materials becomes such an imperative issue to be really take into a consideration in any organization. This is because the printed or physical resources cannot serve the people with greater benefits that the electronic or digital resources can do such as enable for faster and multiple access of the needed materials at any time. In fact, the techniques for information dissemination have also transformed due to the advancement of Internet today (Mondoux & Shiri, 2009). Unfortunately, the shifting of knowledge sharing culture from traditional mean which is through face to face interaction to electronic mean through knowledge repository implementation is definitely not an easy task (Westell, 2006). This is then where the importance of this literature review takes place in identifying the critical success factors of knowledge repository implementation and how imperative or success those factors affect the implementation of the knowledge repository. This review is significant to the top management and employees of an organization for improving the knowledge repository service in the organization which may act as an effective tool towards the enhancement of the organization performance.

The remainder of this paper is organized as follows. Section 1 discusses the introduction of this paper which includes background of study, problem statement, purpose of study and significances of study. Section 2 discusses literature review on the critical success factors of knowledge repository which consist of content coverage, technological function and promotion. Section 3 discusses on model comparison of the critical success factors of knowledge repository by previous researchers. Section 4 highlights the proposed framework on the critical success factors of knowledge repository. Section 5 or the final section contains some concluding remarks.

Issue Relating to Knowledge Repository

Due to the rapid advancement of sophisticated technology in the world nowadays, people tend to maximise or fully make use of the technology as an effective tool in facilitating their tasks efficiently. So do the implementation or utilization of knowledge repository which enables the users to work not only easier but also faster in terms of helping them in retrieving their needed information systematically. This is because knowledge repository acts as a tool to preserve the organization's academic output for long period of time (Westell, 2006). Furthermore, the practices of repositories contribute to the improvement in all aspects of experience-based process (Schneider & von Hunnius, 2003).

This is where a vital transformation from a traditional practice of printed or physical materials to the electronic or digital materials becomes such an imperative issue to be really take into a consideration in any organization. In fact, the techniques for information dissemination have also transformed due to the advancement of Internet today (Mondoux & Shiri, 2009). Unfortunately, the shifting of knowledge sharing culture from traditional mean which is through face to face interaction to electronic mean through knowledge repository implementation is definitely not an easy task (Westell, 2006). This is then where the importance of this study takes place in identifying the critical success factors of knowledge

repository implementation among the users. In order to cater with the issue as discussed above, this paper is aiming to study the factors that are critical or contribute to the success of knowledge repository implementation among the users that leads to developing a proposed framework of the critical success factors of knowledge repository which specifically focuses on content coverage, technological function and promotion of knowledge repository.

Literature Review

In this section, the variables will be discussed deeper or more details by reviewing various literatures from previous researches on the critical success factors of knowledge repository in order to get further understanding and clearer perspective of those variables. Among the discussed variables include knowledge repository itself as well as the critical success factors that contribute or affect the knowledge repository implementation which are the content coverage of knowledge repository, the technological function that supports the knowledge repository development as well as the promotion aspect that publicizes the knowledge repository implementation among the users.

Knowledge Repository

Institutional repository is such a crucial mechanism for scholarly communication as it portrays the vital source of knowledge management and institutional visibility (Lagzian et al., 2015). Similarly, institutional repository is also a platform that assemble the institution digital contents to facilitate the knowledge retrieval process of its communities as well as facilitates the knowledge sharing in organization as it codified the valuable knowledge into explicit form (Farida et al., 2015). At the same time, institutional repository as well being highlighted as a preservation and transmission of digital materials service provided to the university communities (Bevan, 2007). Likewise, the intellectual asset preserved in the digital archive are being produced by the faculty, researchers and even the students and it can be retrieved by both within and outside institution communities (Westell, 2006). In addition, digital repository also being described as a platform for preserving valuable contents of digital materials that can enhance not only administration process but learning and research as well (Shoeb, 2010).

In general, knowledge repository is a computerized system that maintains various digital resources to be accessed by the users electronically. Usually, in each organization either company or even academic institution, there will be at least one electronic or digital system been developed in order to facilitate the communication and tasks within the organization. In this way, the dissemination and exchange of knowledge among the communities will be easier and faster as knowledge repository allows its communities to interact through a single integrated system at anytime and anywhere.

Critical Success Factors (CSF)

Critical success factors (CSFs) are being indicated as the "factors" that are "critical" to the "success" of the institution (Lagzian et al., 2015). On the other hand, CSF in knowledge management can also however act as a significant barrier for successful knowledge management approach in organization (Cahyaningsih et al., 2015). There is also research identifies CSF helps in succeed in knowledge management implementation but can also be the common failed factors of KM that can or should be improved (Altaher, 2010). Apart from that, CSF of knowledge management basically aims to improve the organizational performance (Cahyaningsih et al., 2015). Likewise, critical success factors (CSF) approach

encourages managers to figure out the vital elements that are crucial for the enhancement of organization performance which also act as good indicators of performance in order to ensure the organization to keep surviving and continue to success (Altaher, 2010). In addition, CSFs as well being defined as satisfactory results that act as organization competitive advantages and will lead to the success of organization performance. For decades, western scholars began to pay attention to implement CSFs on knowledge management (Gai & Xu 2009). Therefore, the organization should come out with a proper knowledge management system integrated with certain technologies tools such as knowledge base, collaboration, content and document, search and e-learning. The system should be simple, convenient and suitable to users' needs (Gai & Xu 2009).

Basically, critical success factors (CSF) are the crucial elements that contribute to the success of an event or organization. These elements are such a must or mandatory to be considered when conducting an event or else the event may not goes really well. CSF also important in helping the event or organization to improve its performance by playing their role as the connector between the event itself and the communities. CSF is such an enabler for ensuring the success of an event.

Content Coverage

Content considered as the critical factor that contributes to the utilization of repository (Lagzian et al., 2015). In order for the institutional repository to be easy access and facilitate the knowledge sharing in organization, the contents should be organized in terms of its structure and arrangement. When the users face a hard time during accessing to the needed resources, the effectiveness of institutional repository will not be achieved (Farida et al., 2015). Furthermore, repository will act as the digital archive that deposits the digital contents into cumulative and perpetual therefore the repository contents should be authentic, reliable and integrated to ensure an effective retrieval whenever it is being needed (Alayon et al., 2013). The repository contents usually consist of "research articles, theses and dissertations, unpublished reports, conference papers, teaching and learning materials as well as administrative data" in digital form. An effective repository should be the one that not only organized in terms of its digital contents, but also can be accessed and disseminated widely to worldwide users (Farida et al., 2015). At the same time, self-archiving in institutional repository is important too since it may enhance the knowledge sharing process in which the users are able to deposit the reliable contents into institutional repository by their own (Shoeb, 2010). It should also be emphasized that the effectiveness of the institutional repository will greatly relies on the content or input activity, the resource usage as well as the citation analysis. All of these generated data on the repository effectiveness can be a good benchmark in applying for a fund (Westell, 2006).

Content coverage does affect and contribute for the success of knowledge repository implementation among the communities. However, the quality of the contents being deposited into the repository should be really take seriously in ensuring for effective dissemination and retrieval of knowledge among the communities. To do this, a firm policy should be constructed as a guideline for the communities when utilizing the repository so that they will be more understand regarding the system. The better the quality of the content, the better the performance of the organization.

Technological Function

Institutional repository is primarily driven by information technology as it is indeed an effective tool to contribute for knowledge sharing in organization. Technology too can facilitate the user queries and encourage them to deposit their works into the system through self-archiving (Farida et al., 2015). This can be done when the repository interface is ease of use and there is usage statistic available in order to motivate the users to participate and contribute their works into the system. In order for the institutional repository to work interoperability with the other systems, it thus needs to be supported by the technology. The institutional repository allows for multiple access, long term content preservation, ease of content depository and easy content retrieval too. However, the sustainability of the contents in institutional repository depends on digital preservation strategy (Westell, 2006). Due to low-rated features, authorization issue and non-standard persistent URL of Greenstone, DSpace has been widely used by various organization in developing institutional repository. In fact, DSpace and Eprints are the two software which commonly being used to develop institutional repositories in Southeast Asia. This can be proved when DSpace at International Rice Research Institute (IRRI) is at 742nd rank in the web repositories world ranking with the largest items being deposited (Alayon et al., 2013). On top of that, DSpace has been described as the top preferred open source digital repository software in providing permanent access to digital contents. The application can be download and customize within the needs as DSpace is a free open source. Plus, DSpace organized the contents in hierarchical structure that facilitate its functionalities besides it provides a user friendly interface that easily managed various file formats (Shoeb, 2010).

Generally, technology can be considered as the enabler of knowledge repository as it is a single consolidate integrated system that allow not only for the depository of valuable resources but also for the dissemination and exchange of useful knowledge among its communities. To achieve this objective, technology plays an imperative role in preparing the knowledge repository by providing a medium of ease of use and secured for its communities that can facilitate and enhance their tasks and fulfil their needs. After all, DSpace and Eprints are among the two most convenient repository software that provides people with user friendly features.

Promotion

In order for the institutional repository to be success, the usage of valuable information resources should be publicized and promoted to the patrons by the library managers besides ensuring the contents deposited or available in the repositories (Dorner & Revell, 2012). It is vital and crucial for the librarians to tirelessly promote the repository within the faculty eventhough it is quite hard to change the scholarly communication culture. However, this can be done by attracting the early adopters with adequate and efficient infrastructure that will meet their needs (Westell, 2006). The researchers that are expert in the utilization of institutional repository should promote the important of this issue (Westell, 2006). Indirectly, with this encouragement together with institutional mandate, it will motivate the scholars to deposit their work. The promotion of institutional repository can be effectively done through comprehensive publicity through mandate, organizational website and brochures on the advantages and significances of institutional repository which include the provision of publication on international peer-reviewed journals with higher citations (Lagzian et al., 2015). It is also highlighted that the academicians should be convinced to deposit their researches into institutional repository (Dorner & Revell, 2012). Moreover, the authors emphasized on librarians' role as well in promoting the institutional repository usage

and assisting the academicians in depositing their works into the system which are most of them are reluctant to do so because they do not know the advantages of the repositories (Dorner & Revell, 2012). On top of that, the institutional repository developers who are satisfied with the contents should promote its usage to the users too. Moreover, although it is quite a challenge to promote the institutional repository advantages among people, but it is vital to do so in ensuring the successful utilization of institutional repository (Jain, 2011). After all, the real challenge is indeed the change in culture of information management of the people.

For the conclusion, a good repository system should be promoted or publicized to the communities through various forms either printed or digital medium in order to encourage them to fully utilize and make used of it. People should be informed and educate regarding the massive advantages that the repository can ever offer or serve them especially in their works. Among the vital roles to promote and publicize this usage include the librarians themselves and also the developer of the repository that are considered as the expert and know almost everything about the system. This promotion or publicity is important as many people are still not aware of the current technology that can contribute very much in their works.

A Proposed Framework

In this section, this paper discusses the model comparison on the critical success factors of knowledge repository as proposed by previous researchers that leads to developing a proposed framework on the critical success factors of knowledge repository.

3.1 Model on Institutional Repository Success Factors

Markey et al. (2009) proposes a framework to evaluate the success of institutional repositories that includes these four factors which are content, services, staff and community (Yakel et al., 2007). According to Markey et al. (2009), content and services are considered as the key success factors of institutional repository. This is because content is the core of institutional repository while services as the enabler or technology facility that generate the end user activity such as preservation and retrieval. In terms of staff and community, Markey et al. (2009) have highlighted that it is the role of institutional repository staffs to educate and promote the repository usage among the community or users. It is vital for them to inculcate or change the perception and especially the culture of the users from using traditional method of accessing information into easier and faster digital mean (Yakel et al., 2007).

In accordance with this study, almost every success factors of institutional repository as proposed by Markey et al. (2009) can be relates to this study such as the content factor, the services factor that utilized the technological function as well as the role of the institutional repository staffs in promoting the usage of the institutional repository among the users. Indirectly, this model on institutional repository success factors as proposed by Markey et al. (2009) is relevant to this study. Figure 1. below shows the Model on Institutional Repository Success Factors as proposed by Markey et al. (2009).
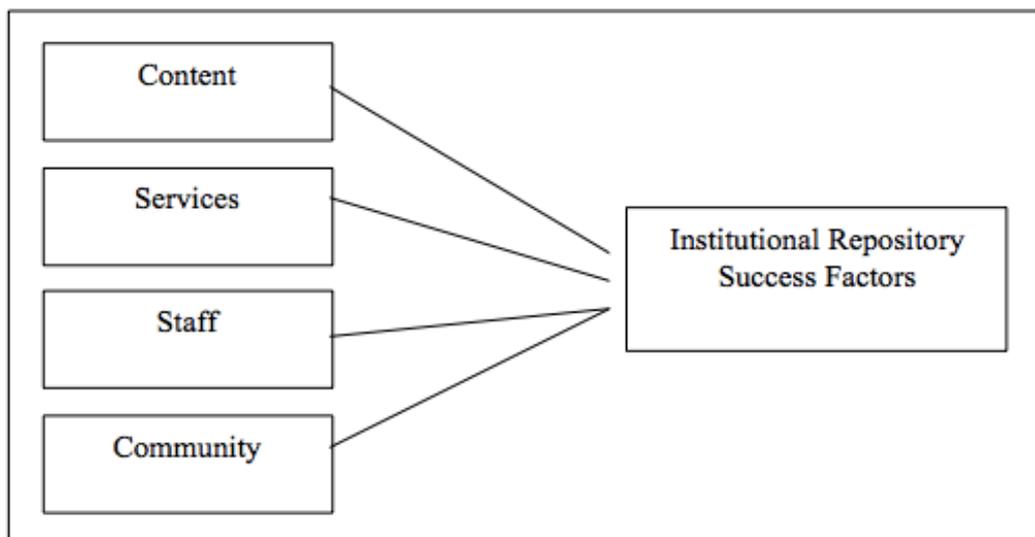
Figure 1. Model on Institutional Repository Success Factors (Markey et al., 2009)

Model on Digital Repositories Success Factors

Thibodeau (2007) proposes a framework to measure the success of digital repositories that includes these five dimensions which are service functionalities, orientation, content coverage, collaboration and state of development (Thibodeau, 2007). Service functionalities means to what extend the system can serve the users, orientation refers to the relationship between preservation and retrieval and how those two elements affected each other, content coverage includes the authenticity and reliability of the resources itself, collaboration emphasizes on the capability of the system either able to operate in silos or need for an association with other functions and lastly state of development concerns on the maturity of repository development .

Likewise to this study, almost every dimension from Thibodeau's framework suit with the elements being investigated which are content coverage and technological function of knowledge repository. Content coverage is also one of the other vital dimensions been proposed by Thibodeau in evaluating the knowledge repository. Meanwhile, the other dimensions as proposed by Thibodeau like service functionalities, orientation, collaboration as well as state of development concern on the technological function of knowledge repository. Therefore, this model on digital repositories success factors as proposed by Thibodeau (2007) is relevant to this study. Figure 2 below shows the Model on Digital Repositories Success Factors as proposed by Thibodeau (2007).
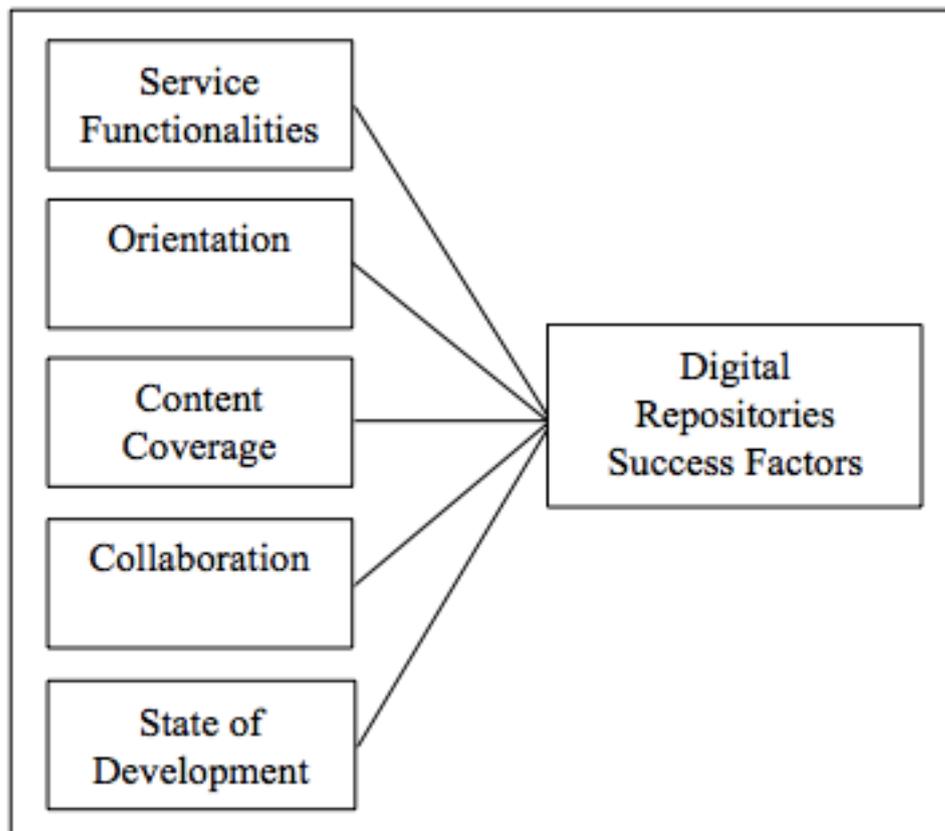
Figure 2.0: Model on Digital Repositories Success Factors (Thibodeau, 2007)

Model on Institutional Repositories Indicators of Success

Westell (2006) proposes a framework to evaluate the success of institutional repositories that includes eight indicators which are mandate, integration with planning, funding model, relationship with digitization centres, interoperability, measurement, promotion as well as preservation strategy (Westell, 2006). Mandate is considered as the key to repository success as it concerns on presenting the repository to the users in an appropriate context by clearly defining its vision and nature. Integration with planning concerns on the structure of repository that suit with the needs of the users. Meanwhile, funding model definitely focuses on the grant developing repository which includes the cost of staffing, technology, content and ongoing archiving. The cost usually been charged annually depending on the collection size and the amount of storage used. Relationship with digitization centres on the other hand concerns on the scanning and publishing of the contents by the expertise. Interoperability includes how each element affect each other in the development of repository. Measurement concerns in measuring the content usage of repository and how far it reflects the visibility of the institution. Promotion emphasizes on the role of librarians in changing the culture of the users in accessing information. Lastly, preservation strategy focuses on the strategy for long term maintenance of repository (Westell, 2006).

Like other models, Westell's model on institutional repositories indicators of success also presents almost every indicator that can relates to this study. They include relationship with digitization centres, interoperability and preservation strategy that utilize technological function as well as promotion. Therefore, this model as proposed by Westell (2006) is relevant

to this study. Figure 3 below shows the Model on Institutional Repositories Indicators of Success as proposed by Westell (2006).
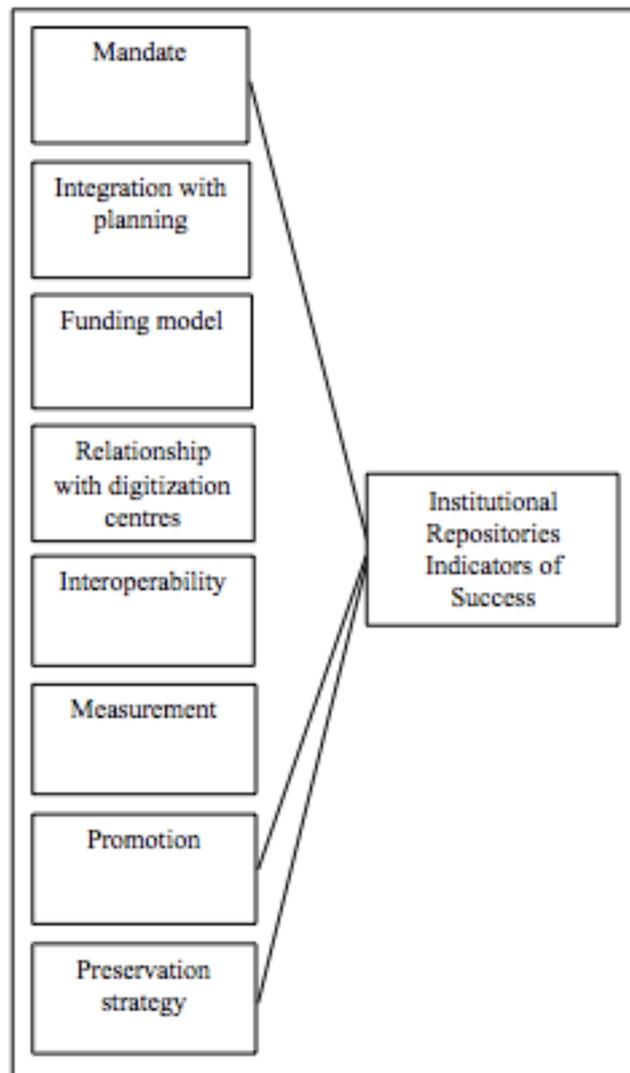

Figure 3. Model on Institutional Repositories Indicators of Success (Westell, 2006)

There are three models been discussed in this section which consist of Model on Institutional Repository Success Factors by Markey et al. (2009) that proposed four factors, Model on Digital Repositories Success Factors by Thibodeau (2007) that proposed five factors and Model on Institutional Repositories Indicators of Success by Westell (2006) that proposed eight indicators. It can be seen that the number of success factors of knowledge repository in each model been decreasing by year. The researchers keep simplifying the model to facilitate the evaluation process of the repository by proposing and highlighting on major vital factors that are critically contributing to the success of knowledge repository. As proposed by Markey et al. (2009), there are four success factors of institutional repository which are content, services, staff and community. These four factors reflect on the importance of content coverage, technological function and promotion in ensuring the success of knowledge

repository implementation. Indirectly, all of these models comparison and discussion are relevant to this study.

Based on the reviewed literature as well the discussed model comparison by previous researchers, a framework on the critical success factors has been proposed and constructed. Basically, the first independent variable (IV1) which is coverage content is being adopted and adapted by past theories and models by Markey et al. (2009) and Thibodeau (2007). Meanwhile, for the second independent variable (IV2), technological function, it is being adopted and adapted based on past theories and models by Markey et al. (2009), Thibodeau (2007) and Westell (2006). The third independent variable (IV3), promotion on the other hand is being adopted and adapted based on past theories and models from Markey et al. (2009) and Westell (2006). The dependent variable (DV) thus will be the critical success factors of knowledge repository. Figure 4 below shows the proposed framework on the critical success factors of knowledge repository.
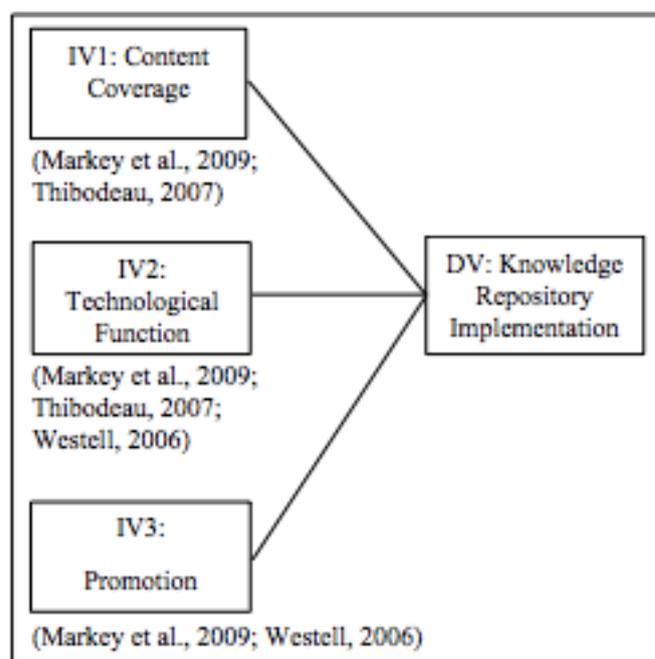

Figure 4. Proposed Framework on the Critical Success Factors of Knowledge Repository Implementation

The significance of proposing content coverage, technological function and promotion as the independent variables (IV) apart from the other variables from past theories and models is because these three variables can be considered as the backbone of the knowledge repository system. If there is no useful content coverage provided in the repository, the system will be useless as there will be no knowledge sharing and exchange occurred as contents are the product or output of the repository. In addition, technology plays a vital role in ensuring the useful content not only can be provided in the system systematically but also allows for effective retrieval of the contents by the users. At the same time, if there is no promotion been conducted to publicize the benefits of knowledge repository implementation, people will not aware of the valuable resources available and provided by the repository and tend to not utilize it.

Conclusion

Living in the 21st century, people really have to cope with the rapid advancement of sophisticated technology nowadays so that they will not left behind the others. It is very vital for them to quickly adapt with the recent invention in order to not only improve themselves but also to enhance the organization performance where they work. In fact, the techniques for information dissemination have also transformed due to the advancement of Internet today (Mondoux & Shiri, 2009). Knowledge repository is indeed one of many effective knowledge management tools that helps a lot in engaging people with valuable resources by easily and promptly exposing and serving them to variety of reliable knowledge through various provision of digital resources which are available for anytime of access. This is because knowledge repository acts as a tool to preserve the organization's academic output for long period of time (Westell, 2006). Furthermore, the practices of repositories contribute to the improvement in all aspects of experience-based process (Schneider & von Hunnius, 2003). This is where the importance of determining the factors that are critically contribute to the success of knowledge repository implementation take place.

Generally, this paper has been structured into several sections. Section 1 discusses the introduction of this paper which includes background of study, problem statement, purpose of study and significances of study. Section 2 discusses literature review on the critical success factors of knowledge repository which consist of content coverage, technological function and promotion. Section 3 discusses on model comparison of the critical success factors of knowledge repository by previous researchers. Section 4 highlights the proposed framework on the critical success factors of knowledge repository. Section 5 or the final section contains some concluding remarks.

It can be concluded that knowledge repository is such an effective tool in helping people perform more effectively and efficiently in their tasks. The content coverage, technological function and promotion on the other hand are the three vital factors that may influence or convince people to utilize the knowledge repository. Further research may be conducted on this topic in the future in order to investigate the relevancy of the proposed framework.

References

Westell, M., (2006) "Institutional repositories: Proposed indicators of success," Library Hi Tech, 24(2), 211-226.

Schneider, K., & von Hunnius, J. P., (2003)"Effective experience repositories for software engineering," 25, 1-6, 2003 [International Conference on Software Engineering].

Mondoux, J., & Shiri, A. (2009)"Institutional repositories in Canadian post-secondary institutions: User interface features and knowledge organization systems," Aslib Proceedings: New Information Perspectives, 61(5), 436-458.

Lagzian, F., Abrizah, A., & Wee, M. C. (2015) "Critical success factors for institutional repositories implementation," The Electronic Library, 33(2), 196-209

Farida.I., Tjakraatmadja, J. H., & Firman, A.,(2015)"A conceptual model of open access institutional repository in Indonesia academic libraries: Viewed from knowledge management perspective," Library Management, 36(1/2), 168-181.

Bevan, S. J. (2007) "Developing an institutional repository: Cranfield QUEprints – a case study," OCLC Systems & Services: International digital library perspectives, 23(2), 170-182.

Shoeb, M.Z. H. (2010)"Developing an institutional repository at a private university in Bangladesh," OCLC Systems & Services: International digital library perspectives, 26(3), 198-213.

Cahyaningsih, E., Sensuse, D. I., & Sari, W. P. (2015) Critical Success Factor of Knowledge Management Implementation in Government Human Capital Management: A Mixed Method. Bandung: ICITSI.

Altaher, A. M. (2010)"Critical success factors of implementation knowledge management process," 340-348.

Gai, S., & Xu, C. (2009) "Research of critical success factors for implementing knowledge management in China,"   561-564. [International Conference on Information Management, Innovation Management and Industrial Engineering].

Alayon, S. B., Nemiz, E. S., Superio, D. L., Garvilles, J., & Pacino, L. G. (2013) "The development of an institutional repository at the Aquaculture Department of the Southeast Asian Fisheries Development Center, Philippines," Program: Electronic Library and Information Systems, 47(4), 384-398.

Barwick, J. (2007) "Building an institutional repository at Loughborough University: Some experiences," Program: Electronic Library and Information Systems, 41(2), 113-123.

Dorner, G., & Revell, J., (2012)"Subject librarians' perceptions of institutional repositories as an information resource," Online Information Review, 36(2), 261-277.

Jain, P.(2011) "New trends and future applications / directions of institutional repositories in academic institutions," Library Review, 60(2), 125-141.

Yakel, E., Rieh, S. Y., Markey, K., Jean, B. S., & Yao, X. (2007) "Secrets of success: Identifying success factors in institutional repositories," 1-4.

Thibodeau, K. (2007)."If you build it, will it fly?: Criteria for success in a digital repository," Journal of Digital Information, 8(2), 1-5.