



PRIMARY RESEARCH

Measuring success factors and performance of institutional repositories

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Abstract

The Institutional Repositories (IR) is a new scholarly communications platform for disseminating the digital contents of a university and academic institution. This study aims to measure the perceptions on six success factors of IR (knowledge sharing, self-archiving, IR usage, IR policy, IR procedure, and copyright awareness) and IR performance among academicians in a Malaysian university and to seek the relationship between success factors of IR and IR performance. A set of questionnaires was distributed to selected academicians in one large faculty of information management in a Malaysian university. The results found that self-archiving, IR policy, and IR procedure are the most preferred response by the respondents, while it was also revealed that IR policy was positively and strongly correlated with IR procedure. The strong relationship between IR policy and IR procedure shows that positive perceptions will help enhance IR performance. The result is significant to the academic libraries in enhancing their repository services and measuring the performance of the university's research activities.

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INTRODUCTION

The rapid development of information technology has made significant changes especially in the development of libraries. The library, which has been deemed to be the place of storage and provision of printed materials in printed form, has turned to a hybrid library where the collection consists of a combination of printed and digital material. With the advancement of the Internet, the management and library services have become extensive especially in the management of digital information format by applying online repository technology or known as IR.

IR or known as IR, is a platform for collecting and managing digital format materials produced by a university or educational institution. In this modern technology era, the definition of IR may be different from one to another (Allard, Mack, & Feltner-Reichert, 2005; Thanyasunthornsakun, Sornsakda, & Boonmee, 2016). Basically, IR is a system that works to acquire, disseminate and protect the intellectual property of a university in order to support teaching, learning and research needs. It is parallel to Lynch (2003), in which a repository of university institutions is

defined as a collection of services provided for institutional management needs and a platform for dissemination of the digital information materials produced by the communities. Among the collections in the IR are theses, dissertation, research report, conference papers, journals and magazine, articles, videos, speeches, examination papers, university publishing books, annual reports, newspaper clippings and others.

With the advancement of open source software such as ePrint, Dspace, Fedora, WEKO, Greenstone and so on, the idea of developing an IR based on the open source concept has sparked among academic libraries of Malaysian public universities. The academic libraries have taken the initiative to enhance visibility and citation of the university research results by providing full text access to the uploaded materials as per outlined in the IR policy.

In Malaysia, all academic libraries of public universities have developed an IR system. With the IR technologies, it is able to increase the visibility of the research outputs produced by university members and at the same time gives motivation to academicians actively in producing the re-

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search products (Abrizah, 2010). The development of IR services is in line with the development of open access in Malaysia, where it helps to enhance research value for public access. With this development, it will encourage other academics to deposit their research outputs into the repository system with the intention to increase the level of readability of unlimited accessed materials globally and also increase the visibility of the articles published (Abrizah, Kaur, Edzan, & Zainab, 2006; Jam, Singh, Ng, & Aziz, 2018). Through this platform, it enhances opportunities for referencing and also opens up research space in collaboration (Zainab, 2010).

The implementation of IR with the concept of open access has saved cost of acquiring information resources by library, especially in database subscriptions. Besides, it has the potential to be a great advantage to authors by helping to promote their research output to the world. Although IR is the future form of scholarly communication platform, it is still not successful in its implementation. It is because of the lack of research output contributions by the stakeholders (Abrizah, 2010) and what is clear is that libraries and information managers have taken a significant role to play in contents development of the IR collections (Revell & Dörner, 2009). The development of this repositories has led to the role of librarians and significant for libraries in today's scholarly communications.

This paper presents the results of a pilot study that aims to measure the perception among academicians on the success factors and performance of IR and identify the relationship between the success factors of IR and IR performance.

LITERATURE REVIEW

Knowledge Sharing

One's attitude to sharing knowledge is one of the indicators to determine the success factor of an IR. Among the major obstacles to sharing research findings often expressed by academics are due to the need to deposit material in self-service in IR along with technical infrastructure issues such as slow bandwidth networks, interface which is not user-friendly, a confused deposit procedures confusing and so on (Abrizah, Hilmi, & Kassim, 2015).

Based on the previous literature, IRs in Asian countries are still considered unsuccessful as targeted compared to the benefits that library users can obtain based on sharing principles such as knowledge storing, knowledge distribution, knowledge exposure, knowledge transfer, knowledge exchange and knowledge collectivism (Abrizah et al., 2015). Abrizah et al. (2015) stated that among the main motivation for researchers to share their research findings in the repos-

itory is closely related to rewards. This is comparable to the findings of research conducted by Venkatesh, Morris, Davis, and Davis (2003) besides enhancing personal achievement such as H-index and Key Performance Indicator (KPI).

Self-Archiving

There are few obstacles that have been identified in generating IR content especially in the early stage of development. Based on the current situation, academics and researchers are not interested and lazy to deposit their research outputs to the IR systems. This situation happens because of the lack of introducing self-archiving mandates to the university members (Jain, 2011) and non-existence of sufficient incentives for their commitments to deposit research output to repositories (Bonilla-Calero, 2014).

IR Usage

The acquisition of repository contents is the greatest obstacle factor faced by librarians to realize an institution repository (Gibbons, 2009; Lagzian, Abrizah, & Wee, 2015). The contents of the institution's repository are important elements especially in the context of academic libraries that support the teaching and learning activities. Close collaboration among lecturers, librarians and researchers can reduce barriers to the implementation and management of this IR.

The library initiatives undertaken through series of promotions especially to enhance and develop the collection of IR contents were seen as not receiving positive reactions from the faculty and research group (Foster & Gibbons, 2005). Awareness programs on the importance of IR content should be taken seriously (Jenkins, Breakstone, & Hixson, 2005) by librarians to faculty members. Librarians with expertise in the field need to work together in the awareness campaign for the collection of materials to ensure that the content of the material obtained were relevant to the needs and standards of the institution repositories (Dörner & Revell, 2012).

Usually, low deposit rates are due to the lack of work procedures and policies of a repository institution besides lack of motivation and low priorities for lecturers and researchers (Chan, 2009). Some universities and institutions have implemented a mandatory research repository system, as requirement to deposit their research outputs to the repository, as has been done at the Hong Kong and Harvard universities (Gardner, 2008). The updating of acquisition policy of IR material is a good solution, but implementation across the policy is another challenge (Pickton & Barwick, 2006; Xia, 2009).

IR Policy

The policy of IR needs to be developed before the selection or development of the system to be used (Riddle, 2015). This is significant to avoid the repositories policy according to system requirements and structures. The university top management should form team of committees among librarians, academicians, legal counsel and researchers to get their views and experienced in research activities to ensure that policies will be developed comprehensively and in line with the current trend of research world.

Meanwhile, three major elements should be covered in IR policy documents such as content guidelines, access policies and preservation policies. Besides that, repository policies must clearly state who (librarians, technologists, contributors and editors) to involve in a participation process, their roles and responsibilities with service repositories (Riddle, 2015).

IR Procedure

Reference librarians can play a significant role in planning, establishing, and supporting IRs (Rockman & Bailey, 2005). Some of the possible activities that they may engage in are:

1. helping to create sensible IR policies and procedures and to provide feedback about how they work in practice.
2. training users in IR deposit and searching procedures.
3. assisting local and remote users with IR utilization, answering questions about IR policies and procedures, and using the IR to answer reference questions.

Copyright Awareness

The confusion over copyright acts has caused problems among researchers and academics to deposit research findings on IR (Lagzian et al., 2015). Makori, Njiraine, and Talam (2015) remarked that copyright act is one of the challenges faced by IR librarians in an effort to strengthen the contents of repositories collections. Most academics do not clearly understand and are confused with the limitations of the copyright act in contributing article published in high-impact journals to the library repository. Besides, concerns over plagiarism also lead to disallowing libraries to upload articles produced into IR systems (Abrizah et al., 2015). Vassilakaki and Moniarou-Papaconstantinou (2015) recommended that librarians should learn and understand in details the content of the copyright act and take a role as copyright advisor to library users especially for new researchers and lecturers. Simons and Richardson (2012) stated that copyright management is an alien skill primarily for repository staff and this factor will slow down the acquisition materials and input activities in the IR (Crow et al.,

2002).

IR Performance

Cullen and Chawner (2010) mentioned that, there is no formal structure to evaluate the repositories performance. All libraries are considered their respective repositories to succeed. Some libraries say that success is measured by their comprehensive repository. Other libraries consider the growth and use of their repositories, though limited, to be their greatest success. They noticed that an item is being downloaded and this indicates that the contents of the repository have been found and are being used. Other measurement highlighted included obtaining a government funding for the project and developing staff expertise in developing a repository. Another success indicator is the collaboration among staff in institutions involved in various consortia and lessons learned from collaboration.

It is clear that the growth of IRs and open access publication is forcing a rethink by all stakeholders such as authors, librarians, publishers, research funders and policy makers on how to evaluate the quality and quantity of scholarly outputs in any given subject area. They must take into account the growing trend towards open access and make use of open access outputs as part of their policy-making and decision tools, but at the same time acknowledging that the entire scholarly publishing environment is in a state of extreme flux and no single tool has emerged for carrying out evaluations of open access materials (Bonilla-Calero, 2014). IR has the potential of increasing the visibility, prestige, ranking and public value of researchers and universities (Anenene, Alegbeleye, & Oyewole, 2017).

RESEARCH METHODOLOGY

In this preliminary study, the Faculty of Information Management (FIM), Universiti Teknologi MARA, Puncak Perdana Campus in Shah Alam, Selangor was chosen as the study setting. It was chosen because of the faculty is the first and largest faculty in Information and Library Management field in Malaysia. Moreover, among the universities that offered the library science program, FIM has the most academic staff in the country. Questionnaire was developed after conducting a comprehensive literature and adopting relevant independent and dependent variables for this research.

As this was a pilot study, questionnaires were personally distributed to a total of twenty-six academic staff in FIM Shah Alam. However, only fifty percent were returned and usable for this analysis. The questionnaire consists of six dimensions on success factors of IR (knowledge sharing,

self-archiving, IR usage, IR policy, IR procedure, copyright awareness) and IR' performance. The 75 items questionnaire was designed based on a Likert Scale of 1 for strongly disagree through 7 for strongly agree.

The data for this study was analyzed using the Statistical Package for Social Sciences (SPSS). Descriptive analysis included frequency, mean and standard deviation while Spearman's rho correlation coefficient was used to identify the relationship between variables.

RESULTS AND DISCUSSION

A reliability test on the dimensions of success factors of IR and IR performance were carried out. Table 1 indicates the results of the reliability tests. It shows that Cronbach's alpha value of knowledge sharing (0.961), self-archiving (0.963), IR usage (0.951), IR policy (0.988), IR procedure (0.988), copyright awareness (0.911) and IR performance (0.958) exceed 0.7. The value is arranged in ranking order. The value of this coefficient was considered high and acceptable.

TABLE 1. Results of reliability test

No	Variables	No. of items	Cronbach's Alpha
1	Knowledge Sharing	11	0.961
2	Self-Archiving	9	0.963
3	IR Usage	10	0.951
4	IR Policy	9	0.988
5	IR Procedure	7	0.988
6	Copyright Awareness	9	0.911
7	IR Performance	12	0.958

Profile of Respondents

The respondents for this survey consists of a higher proportion of female (61.5%) compared to male (38.5%). Most of the respondents hold position in grade DM 51/52 (80%), followed by grade DM 53/54 (15.4%) and JUSA (3.8%). The respondents are PhD holders (61.5%) and the rest (38.5%) are master holders. Almost one-third (30.8%) serves between 11-15 years, while only 3.8% serves between 21-25 years.

Perceptions of IR Success Factors and IR Performance

The descriptive analysis was used to measure the respondents' perceptions and understanding of six IR Success Factors variables. All the scores were then arranged according to ranks with the highest mean which were considered as the most preferred response. The highest mean score of IR success factors dimensions was knowledge sharing (5.71), followed by copyright awareness (5.47), IR usage (5.16), IR

policy (4.32), IR procedure (4.31) and self-archiving (4.14) as shown in Table 2. Thus, knowledge sharing was regarded as the most preferred response as perceived by the targeted respondents. The mean score for IR performance dimension was 5.80.

TABLE 2. Results of level of perceptions of dimension of IR success factors and IR performance

No	Variables	Mean Score	Standard Deviations
IR SUCCESS FACTORS			
1	Knowledge Sharing	5.71	0.938
2	Copyright Awareness	5.47	1.141
3	IR Usage	5.16	1.060
4	IR Policy	4.32	1.443
5	IR Procedure	4.31	1.619
6	Self-Archiving	4.14	1.279
IR PERFORMANCE		5.80	0.793

Relationships between IR Success Factors and IR Performance

A Spearman's rho correlation analysis was carried out to determine the relationships between success factors dimensions and IR performance if any between them. The results as illustrated in Table ?? showed that IR policy was positively and strongly correlated with IR procedure ($p < 0.01$, $r = 0.878$) followed by self-archiving with IR policy ($p < 0.01$, $r = 0.702$). Meanwhile self-archiving was positively and moderately correlated with IR procedure ($p < 0.01$, $r = 0.680$) and followed by IR usage with IR procedure ($p < 0.01$, $r = 0.598$).

Besides, the results show that knowledge sharing was strongly correlated with IR performance and is significant ($p < 0.01$, $r = 0.723$). The interpretation of this relationship is that on the average, a respondent who has a high perception on knowledge sharing is likely to have high perception on the IR performance as well. Besides, copyright awareness was moderately correlated with IR performance ($p < 0.01$, $r = 0.553$). The interpretation of this relationship is significant, a respondent who has a moderate perception on copyright awareness is likely to have moderate perception on the IR performance. Thus, the results revealed significant positive relationships between all variables at the confidence level of 1%.

However, there are weak correlations between IR usage and IR performance ($p < 0.01$, $r = 0.407$), IR procedure and IR performance ($p < 0.01$, $r = 0.242$), IR policy and IR performance ($p < 0.01$, $r = 0.214$), and lastly self-archiving and IR performance ($p < 0.01$, $r = 0.098$).

TABLE 3. Correlation between IR success factors and IR performance

	Knowledge Sharing	Self-Archiving	IR Usage	IR Policy	IR Procedure	Copyright Awareness	IR Performance
Knowledge Sharing	1						
Self-Archiving	0.422**	1					
IR Usage	0.467**	0.490**	1				
IR Policy	0.258	0.702**	0.519**	1			
IR Procedure	0.318	0.680**	0.598**	0.878**	1		
Copyright Awareness	0.546**	0.284	0.488*	0.408*	0.483*	1	
IRp Performance	0.723**	0.098	0.407*	0.214	0.242	0.553**	1

*Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

CONCLUSION AND IMPLICATIONS

The results indicated that respondents have positive perceptions on success factors of IR' dimensions and performance in their academic institutions. The findings of this study revealed that among the six dimensions of success factor of IR, knowledge sharing was found to be the first key factors required in measuring the IR performance. Self-archiving, IR policy and IR procedure showed the most preferred response by the respondents with regards that respondents understood the significant of IR. The study also revealed that IR policy was positively and strongly correlated with IR procedure. The existence of strong relationship between IR policy and IR procedure shows that positive perceptions will help to enhance the IR performance. The limitation of this study is that, this is a preliminary study and the findings were based on data from one faculty of a university. The levels of significance could be improved with wider samples in future study.

In the era of Information and Communication Technology (ICT) sophistication, IR are seen to be relevant and signif-

icant to the academic library environment. With IR, it has helped in promoting research articles and products to be viewed and referred by the university's external and internal research groups. In addition, it also diversifies librarians' services especially in the preparation and dissemination of important material. This initiative has made libraries play a role in collecting, maintaining, controlling and preserving the intellectual property of a university and at the same time it has become a major reference point for universities' intellectual property.

Furthermore, success factors of IR elements can be used as the benchmark to measure the IR performance and level of significant repository services offered by academic libraries and universities. The outcome of this study is expected to improve the role of library services among university community whereby it can assist them easily in searching and retrieving research outputs in one stop center searching platform. Besides, libraries will improve their roles in collecting, maintaining, controlling and preserving the university research outputs in open science environments.

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