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INCOOPERATING KNOWLEDGE SHARING INTO INSTITUTIONAL REPOSITORY TOOLS

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7.1 INTRODUCTION

In the academic institutions, academicians need to accomplish research and publications. The research and publications consist of papers presented at conferences, papers published in journals, articles published in magazine and others. In the current situation of digital world, most of institutional publications and research materials are in the digital form. Therefore most of the institutions have set up a repository in an attempt to "manage their educational research more effectively and transparently than in the past" [18]. Researchers [9] argued that knowledge will be valuable if only it has been shared and used in some way. Knowledge sharing is an activity through which knowledge is exchanged among people, a community and organization. These activities are generally supported by knowledge management systems which are defined as "IT-based systems developed to support and enhance the organizational processes of knowledge creation, storage/retrieval, transfer and application" [1].

Due to rapidly changing technologies, users now desire and expect content in transportable form, which can be utilized in various digital environments where it can be manipulated as they desire. Therefore, the creation of institutional repository (IR) that supports knowledge sharing is a growing requirement.

Publications consist of activity that involved in publishing articles, research papers in journals, presenting papers at conferences

and so forth. These publications are considered as the “intellectual output” of the institution. Therefore, each institution needs to store and retain these assets. In order to make them valuable and useful, the publications should be made visible and shareable to others. There is a growing demand to evaluate the quality of publications in the university particularly faculty. Academicians are expected to be aware of developments in their fields of specialization by participating in original research and scholarship, involving in activities of professional societies and to read the latest research studies produced by their colleagues. There is always a new issue to discuss, further analysis to be done or another topic to confer.

The idea of digital repository has been grasp the imagination of academicians who have a vision of knowledge sharing through open access system. The benefit of digital institutional repository is expected as supplement to the scholarly communication process and as indicator of the quality and quantity of the intellectual output of faculty. Hence, by creating digital institutional repository that support knowledge sharing by academicians, it could help in organizing, structuring and securing scholarly academicians’ publications as well as increasing the number of participation in it. This book chapter will discuss the suitable features of Knowledge Sharing that could be added in the IR that could apply sharing knowledge between the academicians.

7.2 KNOWLEDGE

Data, information and knowledge are the common terms used interchangeably. Data is defined as raw facts whereas a structured and organized data is known as information. Knowledge differs from information in that it resides in people and it is always personal. It can be conceptualized as meaningful and value added information which has been filtered by human minds. In comparison, knowledge has the highest value, the largest relevancy to decisiveness and processes, and the greatest dependency on circumstance and calls for the utmost amount of someone's engagement likened to data and information [7].

There are multiple knowledge definitions proposed in the literature and it is also has been expressed in the different perspectives. Oxford Advance Learner Dictionary defines knowledge as "the facts, information, understanding and skills that a person acquired through experience or education". Knowledge has been defined as a "justified personal belief that increases an individual's capacity to take effective action." [1]

Knowledge defined as "a fluid mix of framed experience, values, contextual information, and expert insights that provides a framework for evaluating and incorporating new experiences and information [7]. It originates in and is applied in the minds of knower. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, process, practices, and norms." Meanwhile, knowledge is considered as "a dynamic human process of justifying personal belief toward the truth" [13]. According to these authors, information is the "flow of messages", and knowledge is created when this flow of messages interacts with the beliefs and commitments of its holders.

7.3 CLASSIFICATION OF KNOWLEDGE

Two main categories of knowledge in organizations; tacit and explicit [13, 14]. Tacit knowledge mainly occupies people's minds and it is comparatively hard to be conveyed, codified and documented. Fundamentally, tacit knowledge "knows how" and includes insights, intuition, hunches, which are often built by experience and difficult to formalize and share [3]. In contrast, explicit knowledge is that which has been articulated, codified and formalized in some electronic or physical form. Explicit knowledge, on the other hand is "knowing about" [3].

7.4 KNOWLEDGE MANAGEMENT

Knowledge Management (KM) is known as "the process by which an

organization creates, captures, and uses knowledge to support and improve the performance of the organization" [11]. KM could also be referred as a wide compilation of organizational practices and approaches associated with creating, capturing, transferring know-how and other content relevant to the organization's business. The term "knowledge management" is suggested to be used to describe a process to manage knowledge since it involves integrating the elements of thinking and feeling as to reveal the fundamental misunderstanding of the nature of knowledge.

"Knowledge management is the systematic, explicit, and deliberate building, renewal and application of knowledge to maximize the enterprise's knowledge related effectiveness and returns from its knowledge assets" [17]. KM is as "a process of leveraging and articulating skills and expertise of employees, supported by information technology" [2]. In knowledge management, technology plays the important role but technology itself cannot make knowledge management happen. [8]. Therefore, by understanding knowledge management it could facilitate to select the right technologies and deploy them.

7.5 KNOWLEDGE SHARING AND TOOLS

KM tools can be divided into three namely Knowledge Acquisition, Knowledge Sharing and Knowledge Dissemination. However, the proposed framework is focusing on knowledge sharing aspect therefore Knowledge Sharing (KS) will be explained in this book chapter

The term knowledge sharing implies the giving and receiving of information framed within a context of the sender of knowledge and the information received framed by the knowledge of the recipient [12]. However, the knowledge receive would not be identical since the method of interpretation is based on individual. Sharing knowledge is identified as the sharing of both tacit and explicit knowledge, followed by knowledge in between of them. Sharing requires a level of trust [16]. It is a two way process and forms an

integral part of relationship building.

Knowledge and information should be kept in order to make sure it will not pour out in all sorts of ways and at all sorts of times. A few techniques can be implemented in order to ensure it is retained in the organization for instance by using traditional information management tools such as shared drives, or modern techniques such as blogs and digital repositories. Few tools for knowledge sharing are in table below [6].

Table 7.1 Knowledge Sharing Tools

Tools	Description
Institutional repositories	Knowledge will be detained within a community either college or university whereby it will be crossed over by many discipline-based communities of practice.
Learning Management System	It is referred to the faculty digital materials on course content.
Individual Weblogs(blogs)	Blogs is created by individuals from communities of practice. The contribution of individual's members could be an important knowledge asset through blogs.

7.6 KNOWLEDGE SHARING PORTAL

Knowledge Sharing Portal functions can be divided into four main categories namely personalization, active process support, and teamwork and document management. Personalization will cover the whole portal while other functions are only for certain area of portal. In the following Figure 7.1 is the Knowledge Portal [10].

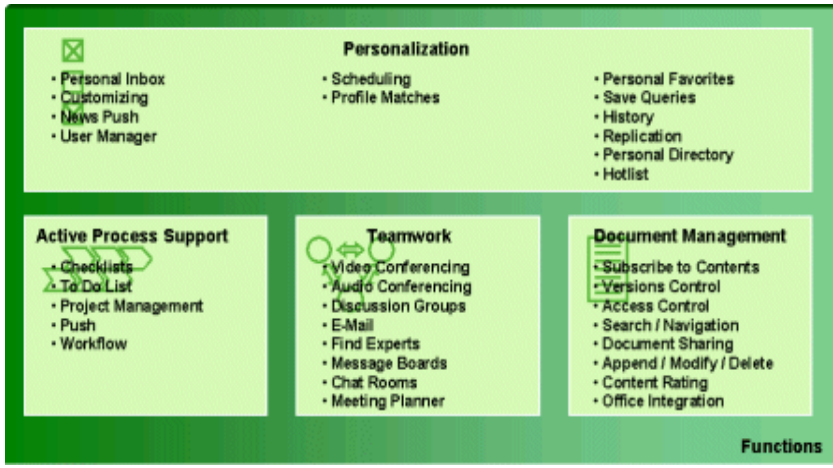

Figure 7.1 Functions of Knowledge Portal (Jansen et. al, 2000)

Although search and discussion functions are in the document management and teamwork category, these features should be available throughout the platform. The most common communication functions are email and discussion group. Search and version control are the most typical document management in knowledge portal and personalization allowed users to tailor their personal working environment according to their interest.

Based on the figure of Knowledge Portal diagram above, a breakdown and explanation of each function has been explained by previous research [18].

Table 7.2 The breakdown of each function of a knowledge portal (Yazid, 2005)

Personalization Functions

Function	Description
Personal Inbox	Start page and "in-tray" for emails, to dos, news and etc.
Customizing	Facility for updating functionalities, content and user interface to suit own requirements and processes.
Replication	Automated download/upload/synchronization facility enabling the user to edit selected content offline.

News Push	Active notification of personalized news and changes.
Hotlist	List of 10 most important contents and tools.
Personal Favourites	Link to content and sources of interest to the user.
Profile Matching	Personal recommendations based on own profile and behavior and/or preferences of other users.
Scheduling	Appointment calendar possibly combined with a meeting planner.
Save Queries	Storage of search queries so that they can be found again more easily.
History	List of contents most recently used.
Personal Directory	Further development of Personal Favourites in the direction of individual data storage.

Active Support Process Functions

Function	Description
Checklist	List of tasks within a process (sequential or any order) linked with content and functionality.
Workflows	Active user support in the case of sequential processes through the provision of specific content and functionalities.
Push	Active notification of news / changes and/ or pending tasks.
To Do List	Personal or project-related list with current to dos, possibly linked with content and tools.

Teamwork Functions

Function	Description
Email	Medium for asynchronous communication.
Message Boards	Facility for publicly posting thoughts and ideas.
Discussion Group	Asynchronous discussion of typical issues.
Document Sharing	Joint editing of documents; the knowledge portal has to be integrated with common Office application.
Chat Rooms	Synchronous discussion facility for fast, informal clarification of (usually simple) questions.
Find Experts	Skill management functions for finding suitable contacts.
Video Conferencing	Richest form of IT-supported communication, but still somewhat problematical due to the equipment required

	and the lack of bandwidths.
Audio Conferencing	Extended form of chat room.
Meeting Planner	Tool for joint planning of meeting, possibly in connection with a conferencing functionality which supports the meeting.
Email	Medium for asynchronous communication.
Message Boards	Facility for publicly posting thoughts and ideas.

Document Management Functions

Function	Description
Search/Navigation	Structured attribute search, full text search and navigation along a tree structure to access content.
Office Integration	Automatic opening and saving of knowledge portal documents within the familiar Office environment.
Append/Modify/Del	Add, edit and delete own content and that of others (where authorized).
Access Control	Access control via profiles, roles and authorization.
Version Control	Document version management.
Content Rating	Content evaluation and hence possibility for influencing the positioning of a document.
Subscribe to Contents	Selection of topics of interest for automatic notification in the event of modification.

7.7 DIGITAL REPOSITORIES

A digital repository is defined as a place to retain objects in digital form. Examples of digital objects are journal article, digital video, digital book and many more. A flexible digital repository should allow storing all types of digital objects. The firm's definition of the term "digital repositories" has been an issue that generates many discussions and there is almost certain that agreement for a common definition would not be achieved. One of the main reasons for this uncertainty is that digital repositories are mainly characterized by the type of content that makes available and by the reasons that necessitate its creation and functionality.

7.8 TYPES OF DIGITAL REPOSITORIES

There are two types of digital repositories stated by CEN WS-LT Learning Technology Standards Observatory) are briefly explained as follows:

a) Institutional Repositories

An institutional repository is a web-based database (repositories) of scholarly material. It is institutionally defined as depend upon the each institution for record collection. The institutional repositories collect stores and disseminate digital resources and long term preserves these digital materials. It is a type of service offered by institution/university to the members of their community to collect, store and distribute their digital materials.

b) Digital Library

The term digital library (DL) is huge, whereby it covers many and different applications such as digitized collections, library websites, etc. Moreover the current electronic publishing business models enrich the DL technology aiming to provide powerful information access options to the users.

7.9 INSTITUTIONAL REPOSITORIES

Institutional repositories are defined as “digital collections that capture and preserve the intellectual output of a single or multi-university community” [4]. An institutional repository stores and makes accessible the educational materials, research and associated assets of an institution whereas some repositories focus on particular subject domains. In current situation, institutional repository such as e-prints and D-space provide open access to the research outputs of a university or research institution. Thus, establishment of IR will contribute to an equal global knowledge pool.

7.10 PREVIOUS STUDIES ON INSTITUTIONAL REPOSITORIES

Parts of literature review mentioned above have been given adequate basic theory, opportunities and challenges to fulfill this chapter. The researcher has discussed all related information needed in order to get close with the two main concepts namely knowledge sharing and institutional repositories. The literature study and findings by other researches help to understand the overview of knowledge, knowledge management and knowledge sharing as well as institutional repositories in terms of definition, types, component and tools. All information collected will help in designing IR framework that cope with the restriction of current IR.

In order to provide sharing knowledge for IR, researcher needs to expand information and knowledge on Knowledge Sharing and factors that influence the contribution to it. By implementing the factors learnt in the development, a useful system could be developed accordingly to the needs. All the information acquired leads to the initial answer for the problem statement which is "How to develop Institutional Repositories (IR) that promotes knowledge sharing?"

7.11 QUESTIONNAIRE ANALYSIS AND PROPOSED FRAMEWORK

7.11.1 Data Analysis

Five selected experts have been chosen in answering a set of questionnaires. All of them are lecturers that have more than 7 years experience particularly in Knowledge Management field. The purpose of the survey is to understand the factors and functions of knowledge sharing success factors to include them into IR development. The questionnaire covers Knowledge Sharing Factors and Functions as explained in the analysis below.

7.11.1.1 Knowledge Sharing Factors and Functions

In this section, experts numerated the importance of choosing knowledge sharing factors and functions into IR. The factors have been divided into two parts which is organization and content. The functions of knowledge sharing portal is in two parts which is list of personalization function and teamwork function.

a) Organizational Success Factor

The following table shows the result for organizational success factors chosen by the experts. The items have been numerated from 1 to 9 whereby: 1 –The Most Important, 9 – The Least Important

Table 7.3 Result of the importance of knowledge sharing success factors

No.	Items	1	2	3	4	5	6	7	8	9	Total	Standard Deviation
1.	Business Context	1	0	0	1	1	0	1	0	0	4	0.527
2.	Organizational Structure and Roles	0	1	1	0	2	1	0	0	0	5	0.726
3.	Organizational Processes	0	1	0	1	0	0	0	1	1	4	0.527
4.	Organizational Culture	2	2	0	0	1	0	0	0	0	5	0.882
5.	Physical Environment	0	0	0	0	0	1	2	1	1	5	0.726
6.	Participation Measurement	0	0	1	1	0	2	0	1	0	5	0.726
7.	Motivation	0	0	2	1	0	1	0	0	0	5	0.726
8.	Training	0	0	0	1	1	0	2	1	0	5	0.726
9.	Leadership	2	1	1	0	0	0	0	0	1	5	0.726

From the data analysis that had been done, the above table shows that all of the factors are important in implementing knowledge sharing in the organization based on the result that is shown above.

b) Content Requirement

The following table shows the result for content requirements chosen by the experts. The items have been numerated from 1 to 4 whereby: 1 –The Most Important, 4 –The Least Important

Table 7.4 Result of content requirement in IR

No.	Content Requirement	1	2	3	4	Sum	Standard Deviation
1.	Trusted	2	1	1	1	5	0.548
2.	Personalization	1	0	3	1	5	1.095
3.	Openness	2	2	0	1	5	0.894
4.	Current Material	0	2	1	2	5	1.00

The above table shows that the most content requirement needed in ensuring the success of IR are trusted material and openness of the content. The factors are chosen based on the lower standard deviation. It is stated that the lower standard deviation is the closest with the mean or the average.

c) Personalization Function

The following table shows the result for personalization function chosen by the experts

Table 7.5 Data analysis for personalization function

No.	Personalization Function	Frequency
1.	Personal Inbox	3
2.	Personal Directory	4
3.	Customizing	4
4.	Personal Favorites	4
5.	News Push	2
6.	History	3

Based on the analyzed result above, the higher frequency of functions listed shows that for personalization function, personal directory, customizing and personal favorites are the most needed in the IR

d) Teamwork Function

The following Table 6 shows the result for teamwork function chosen by the experts.

Table 7.6 Data analysis on teamwork function

No.	Teamwork Function	**Frequency**
1.	Chat Rooms	1
2.	Find Experts	4
3.	Message Boards	1
4.	Discussion Groups	5

Based on the above result, most experts agreed that Find Experts and Discussion Groups functions are needed in the IR to enable knowledge sharing.

From the survey results, researcher has designed the most important factors and functions that could support knowledge sharing in developing IR. The initial framework is proposed as in the following sub topic.

7.12 THE PROPOSED MODEL FOR IR THAT PROMOTE KNOWLEDGE SHARING

Since this research is to add functions of knowledge sharing into IR, only factors on content and personalization and teamwork functions that have been chosen by expert will be considered. Current implementation on IR will be remained as only features on knowledge sharing will be added. A proposed IR framework that promotes knowledge sharing features is shown in the following Figure 7.2.

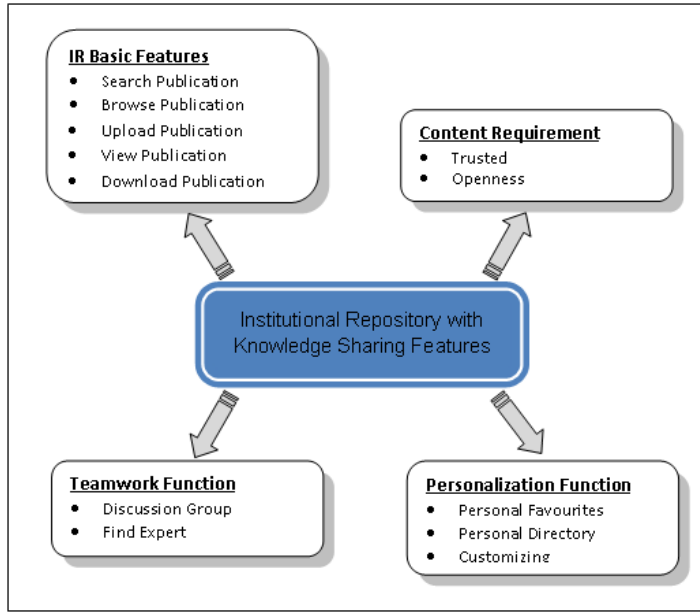

Figure 7.2 Proposed IR framework with Knowledge Sharing Features

The development of IR that promotes Knowledge Sharing features has taken into consideration the requirements by expert. The main function of the prototype is to allow academicians to exchange views and ideas that they have on any matters submitted into the IR especially pertaining to publication purposes. The user would have a screen for them to input information and interact with.

7.12.1 Search Module

This module is part of modules of IR. User of IR can browse through the IR based on the year, subject, type and author. This module will list out publications found in IR based on the selected type of browsing.

7.12.2 Personalization Module

Another module within IR environment is Personalization. Personalization is an important module developed for the academicians to provide information related to their profile and experiences. Three modules of Personalization have been highlighted which consists of Personal Favorites, Personal Directory and Customizing. The sub menus listed under Personalization Module are arranged according to the functions and suitability within the IR environment.

7.12.3 Teamwork Module

This module has been developed with the intention in providing information and knowledge to academicians, which consists of discussion room and finding experts. Teamwork module is purposely allowing the academicians to communicate directly either personally or in group. This module is also developed for academician to contact other academicians that they found through their searching on this IR which permitting them to retrieve the academician profile. By then, academician that holds certain profile features and expertise can be contacted for the benefit of publication and research activities.

Another function in teamwork module is discussion group. Discussion is the module that has been developed with the intention of providing a platform for the academicians to interact with, whether in terms of sharing and contributing their knowledge, proposing new ideas, and generating any or new discussions' topic. This module consists of General Discussion and Expertise Discussion. Consequently, these module with the contents highlighted provide the platform for interaction and information exchange towards knowledge sharing. Besides, academicians are allowed to view and rate their most preferable discussion's topic posted by others.

7.13 CONCLUSION

This study has examined and looked into several related issues within knowledge sharing and IR. The findings on knowledge sharing success factors and knowledge sharing portal have contributed to further phases in process of designing and developing IR that promotes knowledge sharing.

The main question for this research that needs to answer is "How to develop Institutional Repositories (IR) that promotes knowledge sharing?" The question has been answered by the proposed framework The framework is intended to foster academicians to continually and persistently seeking, sharing and contributing more knowledge in better ways towards a healthy knowledge sharing environment. As a result, the publication and research activities will be conducted smoothly and thoroughly in order to improve its quality.

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