

**KNOWLEDGE MANAGEMENT INITIATIVE
IN INDOONESIAN HIGHER EDUCATION:
OPEN ACCESS INSTITUTIONAL REPOSITORY IN ACADEMIC LIBRARY**

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ABSTRACTS

Higher Education (HE) is one of the organizations interested in using Knowledge Management (KM) for managing its abundant intellectual assets, particularly when it faces many national and international challenges. Knowledge Management implementation is almost unheard of in Indonesian universities. Some Higher Education institutions, however, have eventually made KM initiatives by developing Institutional Repository (IR). Most of IRs are part of academic digital library infrastucture, offering their resources for public audiences known as Open Access Institutional Repository (OAIR). The main reason for developing OAIR in Higher Education is to assist the university or research institution in capturing its own scholarship produced as a whole and in sharing knowledge. This paper focuses on conceptual model of OAIR in order to enrich knowledge content and enhance global access.

Keywords: Indonesian Higher Education, Knowledge Management, Institutional Repository, Open Access Institutional Repository (OAIR).

INTRODUCTION

Knowledge Management (KM) trends have emerged in the 21st century as a new strategic tool for achieving organization's goals in efficient and effective manner. KM started flourishing as many business enterprises became aware that knowledge when organized, preserved and disseminated throughout organization, will become a resource for continuous knowledge creation and innovation. It will bring tremendous impact for attaining success in this global competitive era (Davenport & Prusak, 1998; Koskinen & Pihlanto, 2008). Although KM is eventually applied in profit based organizations, KM can be carried out in any organization. It is becoming a key element for any organization striving to have better performance in information age. Higher Education (HE) is one of organizations interested in using Knowledge Management for managing its abundant knowledge assets, particularly when it faces many national and international challenges - to enhance educational quality performance; to reinforce position as research university; to compete as world class university; to appear in webometrics; to emerge as international university; to obtain recognition and accreditation; to tackle faculty aging; etc.

The leader of KM initiative in Indonesian HE is academic library, especially when it supports Open Access Institutional Repository (OAIR) known as green roads movement that is to

make available the scholarly work produced by the academic community for global audience without economic barriers. Institutional Repository refers to a set of service to manage, preserve, maintain, disseminate the intellectual assets of an organization in digital format. ((Lynch, 2003) Drake, 2004). Initially, IR is an effort to gather local content of academic works from an institution in digital format with the objective for facilitating access of knowledge produced by community campus; mostly the access is restricted to its community. Open Access (OA) Initiaves which declared in Budapest in 2001 gives a common ground to reform the existing system of scholarly communication where it encourage scholars to publish their scholarly articles to OA journal or to OA repository for assuring that world-wide audiences can access their articles without economic barrier. (Yiotis, 2005)

The OA Initiative emerges from scholarly communication crisis where traditional scholarly communication system has economic barrier to disseminate scholarly articles. It is expensive and it only can be accessed exclusively by people who subscribe through individual or institutional subscription. Open Access Institutional Repository becomes new alternative to share scholarly works to wide audience. Scholarly articles in OAIR can be accessible without payment. The idea for widely opening the scholarly articles is to share knowledge to people who need the information without payment. Although the article published in a peer-review, established journal has carried more appreciation in the academic world, the article published in OAIR has more chance to be seen by many scholars since it is not limited only to colleagues who have access to journal's subscription; it may be cited many more times; and therefore have a larger impact in the field of scholarship. In the long term, OAIR provides benefits for the institutions such as branding for institution scholarship, centralizing a campus' scholarly works and making scholarship available to wider audiences. ((Dill & Palmer, 2005)

Mccord (2003) views Institutional repositories as "a visible manifestation of the emerging importance of knowledge management within Higher Education." Branin, (2005) argues that KM implementation in academic context institutions is by building IR in order to manage wide range of scholarly digital works created by community members in university. IR works similarly with knowledge repository in KM practice that is to capture codified or explicit knowledge which is valuable to the organization. In business context, the knowledge asset captured in the form of lesson learned, best practices, patent and others, In Higher Education, the knowledge captured is in the form of journal articles, thesis, dissertation, unpublished reports, conference papers, and others. Both are managed and stored in the database to assure knowledge preservation and facilitate knowledge sharing. Since IR is regarded as KM visible manifestation and as KM implementation in Higher Education or academic context, Open Access IR which has goal to reach more audience to view and share its scholarship content is considered as KM either. In this paper, OAIR in Indonesian Higher Education is viewed as Knowledge Management initiative within academic context institutions.

Indonesia, like many developing countries characterized by economies in transition, is often faced with acute problems of limited access to scholarly works, mainly caused by continually rising costs of scientific journals subscription and tight budget of academic libraries. Adopting OAIR in Indonesian Higher Education is especially promising for sharing its knowledge assets to enhance global access of Indonesian scholarly works and eventually enhance research impact (Davies, 2007). In 2009, there was a national effort to share local knowledge content from various institutions in Indonesia including OAIRs in Higher Education. Directorate of Research and Service Community-Higher Education, Ministry of Education and Culture (*Direktorat Penelitian dan Pengabdian pada Masyarakat/DP2PM*

Dikti – Mendikbud RI) collaborated with University of Indonesia to build a portal named Garuda, the abbreviation of *Garba Rujukan Digital*. This portal provides open access to its content. This portal harvesting its content from the members which so far comprised of Higher Educations, Research Institutions, National Library, public libraries and other institutions. This portal is expected as a single portal for knowledge sharing and exposing Indonesian works to wider audiences. Out of 3.098 Higher Education Institutions in Indonesia (Dikti, 2013), only 318 institutions join as the contributors of knowledge content. The challenge of this portal is that its knowledge content to be shared is very depended on the contributors policy and contributors knowledge content.

Building OAIR in HE, especially in developing its knowledge content is not an easy task. Learning from previous literatures, a conceptual model of OAIR is developed. The proposed conceptual model focuses on three constructs; people, process and technological function. These three needs to be considered when developing an OAIR in HE in order to capture its academic works and to develop knowledge sharing culture in Indonesian Higher Education.

BENEFITS OF OPEN ACCESS INSTITUTIONAL REPOSITORIES

The intellectual work of academics is the core business of Higher Education (HE) institution. Much of this work is documented in research papers and in materials used for teaching and learning “(Jacobs, Thomas, & McGregor, 2008). University is a place where knowledge is intensively created, generated, and shared in ongoing academic life activities of learning, teaching, research and community service. Many universities start to recognize knowledge as intellectual assets which should be preserved and shared to its community as well as to public in general by building OAIR. Turning individual knowledge into intellectual asset’s of organization is the concern of KM. (Wedman & Wang, 2005). Those assets often become local intellectual assets such as personal binders and files or team, department, or plant-specific operating rules and libraries. The following is the benefits of OAIR:

Provides a Single Consolidated Integrated System:

The reason for developing OAIR in HE is the difficulty of university or research institution to know its own research result as a whole. Chen & Hsiang (2009) mentioned that the problem of Taiwan and other Asian countries are the low academic impact compare to American and European research institutes. Several factors are pointed out: First, There is no single consolidated integrated system of an institution for scholarly information and dissemination within an institution. Research outputs usually are located in different information systems which make potential users having hard times in searching, browsing and accessing the scattered information. Second, the service is not well supported and only provides metadata and abstracts rather than full text. And Lastly, There is no systematic ways to deposit scholarly output of the institution in digital format like conference papers and technical reports. Thus, OAIR provides a single consolidated integrated system for easy access and facilitate knowledge sharing.

Makes the Scholarly Works Accessible to World Wide Audiences

The main purpose of disseminating intellectual works is to make those works accessible to world-wide audiences so that others scholars can use and cite the works in the process of creating new knowledge. Providing free available full text through internet access is a good strategy to increase citation times and increase the reputation of the institution. Publication of scholarly paper, research result in journals is a traditional way of scholarly communication. The journal publisher has well build infrastructure and procedure to publish articles, there are

many steps involved, articles is peer reviewed, corrected and edited before publication. However, the ever increasing cost of journal subscription is burdened most of academic libraries thus only few can subscribe journal. In Indonesia, it is only few academic libraries which able to subscribe to online journals and they only can be accessed by exclusive communities that are only members of the university who has the privilege to access the journals, so the scholarly communication of the academic works is not effective and efficient.

Dill & Palmer (2005) mentioned several reasons why OAIR becomes one consideration to be implemented in university for scholarly communication. The following are the reasons to implement OAIR; increasing journal price paired with budget cuts, increasing awareness of authors' copyright; increasing dissatisfaction with the speed of research cycle and limited access of scholarship dissemination through traditional publication method.

One study conducted by Hajjem et al (2005) found out that that free online papers will increase their cited times from 50 percent to 250 percent. The journal purchasing by 91 percent of budget only created 38 percent citations, but freely available online scholarly information and other resources purchased by using the rest of 9 percent of budget created 62 percent citations. (Bergstorm, 2001 as cited in Chen & Hsiang, 2009) These statistics showed open access greatly decreased the cost in dissemination of scholarly information, online papers greatly increased their cited times, and freely available online papers contribute major part of citations.

OPEN ACCESS INSTITUTIONAL REPOSITORY (OAIR) IN ACADEMIC LIBRARIES

Indonesian OAIRs in Ranking Web of Repositories

There are 32 OAIRs that appear in Ranking Web of Repositories (RWR) out of 1654, the total number of Repositories world-wide. Below is the table of OAIR institutions in Indonesia issued by webometrics for January 2013 edition. Webometrics Ranking is one of measurements available to assess the contribution of institutions. There are five types of webometrics ranking - universities, repositories, business schools, research centers and hospitals publishing their scholarly work through internet. The main objective of Webometrics Ranking is to support OA initiatives and to promote global access of academic knowledge produced by the institutions.

From these 32 OAIRs, The top rank of local repositories in Indonesia is held by Institut Teknologi Sepuluh Nopember Repository, ranking internationally in the 26th position. The lowest position, ranked locally as number 32 is Universitas Pelita Harapan Institutional Repository which is ranked globally in the 1650th position". Only one repository is not affiliated with HE which is LIPI Institutional Repository *Lembaga Ilmu Pengetahuan Indonesia*/Indonesian Institute of Sciences ranking 30th in Indonesia. The rest of repositories are in Higher Education and mostly related with academic libraries.

Table 1
Repositories World Wide, January 2013

Ranking	World Rank	Institution	Size	Visibility	Files Rich	scholar
1	26	Institut Teknologi Sepuluh Nopember Repository	8	211	4	8
2	32	Diponegoro University Institutional Repository	245	104	33	14
3	57	Bogor Agricultural University Scientific Repository	110	264	7	19
4	60	Universitas Muhammadiyah Surakarta Digital Library	180	295	20	11
5	73	Gunadarma University Repository	752	64	408	87
6	188	Andalas University Repository	224	80	139	767
7	238	E-Library Universitas Brawijaya	305	886	30	31
8	239	Yogyakarta State University Repository	411	666	176	64
9	363	UPN Veteran Jatim Repository	1012	688	286	140
10	364	Digital Library Universitas Islam Negeri Sunan Kalijaga Yogyakarta	737	839	458	58
11	372	University of Muhammadiyah Malang Institutional Repository	532	978	186	60
12	445	Hasanuddin University Repository	670	675	351	389
13	476	Institutional Repository UPN 'Veteran' Yogyakarta	1058	915	449	133
14	514	Petra Christian University Scientific Repository	349	961	1013	137
15	516	Repository Universitas Padjadjaran	618	1049	294	211
16	639	University of Sumatera Utara Repository	44	96	12	1440
17	779	(1) UIANA Universitas Indonesia	625	1240	1087	270
18	790	Politeknik Elektronika Negeri Surabaya Repository	901	1183	989	342
19	822	Universitas Sebelas Maret Institutional Repository	1263	818	1003	751
20	826	Sriwijaya University UNSRI Online Repository	1205	1149	733	510
21	841	Graduate Program of Management and Business Bogor Agricultural University Repository	1179	1052	355	804
22	913	Digital Library of Institut Teknologi Bandung	182	434	732	1366
23	938	Eprints STMIK GI MDP & MDP Business School	884	1341	858	527
24	984	Repositori Universitas Muria Kudus	1253	1398	508	634
25	1077	University of Surabaya Repository	927	1377	811	884
26	1219	Repository Library of Malang University	1416	1137	1023	1165
27	1242	IAIN Sunan Ampel Repository	1606	1105	1456	646
28	1337	Documents Repository Dian Nuswantoro University	1425	1527	1193	1023
29	1630	Institut Seni Indonesia Denpasar Institutional Repository	1559	1611	1456	1440
30	1635	LIPI Institutional Repository Lembaga Ilmu Pengetahuan Indonesia / Indonesian Institute of Sciences	1623	1558	1456	1440
31	1650	Universitas Pesantren Tinggi Darul 'Ulum Digital Repository	1524	1651	1456	1440
32	1653	Universitas Pelita Harapan Institutional Repository	1623	1653	1456	1440

Source: <http://repositories.webometrics.info/en/Asia/Indonesia>

Indonesian OAIR in *Open DOAR*

Out of these 32 academic open repositories, there are 25 registered in *OpenDOAR*. *OpenDOAR* is an authoritative directory of academic open access repositories. *OpenDOAR* provides searching tool to find repositories and users are able to search using different approaches like subject, content type, repository type, country, language and software. This directory also gives *Google custom search engine* for searching the knowledge contents listed in *OpenDOAR* freely and almost academic contents are available full text.

Statistic of content types in *OpenDOAR*-Indonesia showed that OAIRs knowledge content in Indonesia consist mainly of journal articles, thesis and dissertations, followed by other content types; conference & workshop papers, books, chapters and sections, unpublished reports and working papers, learning objects, bibliographic references, multimedia and audio-visual materials, other special types and patents. The following is the statistic of content types from *OpenDOAR*-Indonesia:

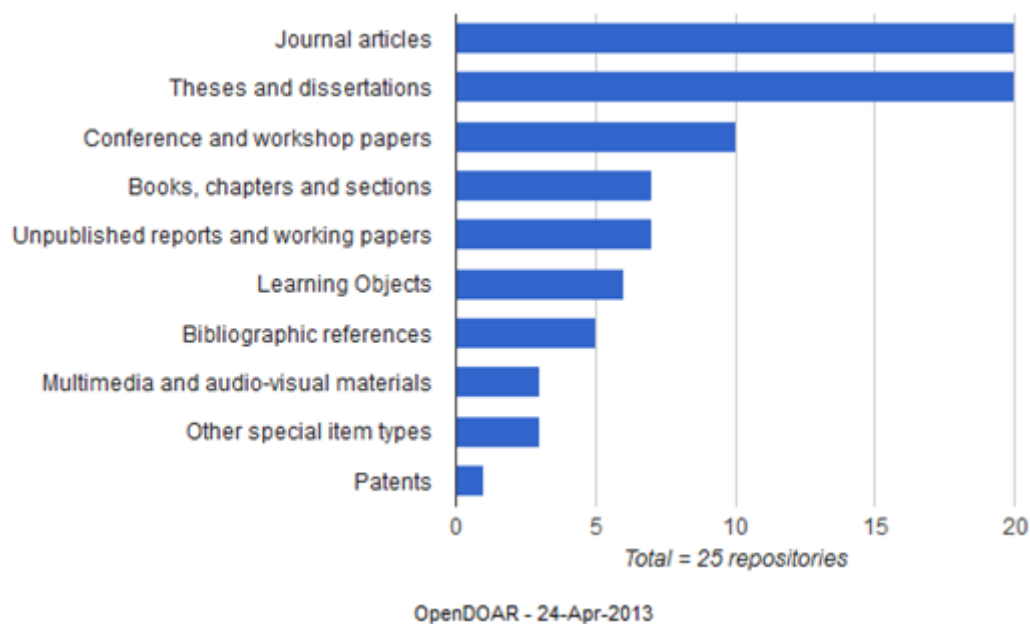


Figure 1
Content Types in *OpenDOAR*-Indonesia

OAIR as Contributor for Garuda

The main contributors of Garuda are from Higher Institutions. Out of 318 contributors in Garuda, 289 (91 %) are from academic portal. The rest comes from online journals 29 (9%). These academic portals are not necessarily an OAIR but they have potential to be a Knowledge Management Initiative. Unfortunately the contributors are lacking of knowledge content, 78% (226) of the contributors only have less than 1000 titles while the contributors who have more than 10,000 titles are 22% (63).

Mandatory Policy

In order to gather scholarly works, some of the academics librarians are supported by the authority of campus, Rector, to legally endorse them with a decree issued by the rector. Some of OAIR in Higher Education has the decree which requires research unit, academia, and staff to submit their scholarly works to the repository. Though it has no sanction for the people who are reluctant to do so, it helps librarians to gather academic works in legitimate way.

Sutedjo (2012) identified mandatory policy from campus authority as a strategy in developing Institut Teknologi Sepuluh Nopember (ITS) repository. In Indonesia, traditionally, library gathers all academic works produced by students like undergraduate thesis, thesis, and dissertation. When many libraries turn out to be digital libraries, these work are then scanned and converted to digital format. That is why when library build Institutional Repository, the main collection is undergraduate thesis, thesis and dissertation. However, when HE decides to open their access, Higher Education must put more emphasize on exposing scholarly articles based on research to global audience. The objective is to increase citations, enhance research impact and leverage the scholarship visibility. To capture more scholarly works in different types of knowledge from campus community, some OAIRs are supported by mandatory policy from its HE's authority. Below are the examples of Mandatory policy issued by some of Higher Educations.

Table 2.
Example of Mandatory Policy in Indonesian HE

No.	OAIR	Mandatory Policy	Knowledge Type Acquired	Target
1.	IPB Repository (repository.ipb.ac.id)	Compulsory submission of scholarly works Peraturan Rektor Institut Pertanian Bogor. Nomor 06/13/PL/2010	Undergraduate thesis, thesis, dissertation, Research report, Textbook, Reference Books, Book Module, academic speech, speech of senior lecturer, practicum guidelines, scholarly journals, articles of scholarly journals, patent, result of writing scholarly competition, seminar paper, proceeding.	Unit, sivitas academic, educational human resources
2	ITS Digital Repository (digilib.its.ac.id)	Compulsory submission of scholarly works. Rector decree of Institut Teknologi Sepuluh Nopember Number: 5455.5/12/LL/2008	Final Paper. Thesis, dissertation, textbook, book module, research and community service report, practicum report, workshop/seminar papers, academic speech, inaugural speech, practicum guidelines book, scientific paper, patent result, result of student competition award from the 1 st to 3 rd position in institute/regional/national/and international level.	academia
3.	Ubaya Repository (repository.ubaya.ac.id)	Compulsory submission of scholarly works Rector decree of Universitas Surabaya, number 383 year 2012	Undergraduate thesis, thesis, dissertation, textbook, book module, research and community service report, practicum report, workshop/seminar papers, scientific speech, inaugural speech, practicum guidelines book, scientific paper, patent result, result of student competition award from the 1 st to 3 rd position in institute/regional/national/and international level.	Unit of the university, academia and staff.

Besides the mandatory policy, recently there is a policy from government, directorate general of higher education, ministry of educational and culture which encourage every HE to have its own OAIR. From December 11, 2011 onward, every lecturer who wants promotion, he or

she must provide the address of his or her scholarly works on website either on journal online, institutional repository, Garuda or other portal. Otherwise, those works have zero points in promotional assessment (Dikti, 2011). It means the librarian able to identify and recruit the scholarly works and put them on the OAIR or link to online journal. The policy affirmed a decree issued before; Indonesian government no. 37 year 2009 of lecturer, article 8 verse 1. It stated that post lecturer certification; every faculty must report in narration their academic performance in three mandates in every semester. Faculty's certification is Indonesian government evaluation to enhance lectures' academic professionalism. However, so far the hard copies or soft copy of those academic performance evidences such as textbook, research publication, research report, learning object, and etc are not submitted. Librarian can use this activity as one of the strategy to gather knowledge content for every lecturer in every semester and upload those academic works to OAIR. Librarian can use the government policy and decree to motivate lecturer to submit their work to OAIR.

A CONCEPTUAL DEVELOPMENT OF OAIR

Petrides and Nguyen (2006) emphasized that application of KM in HE must learn from some business sectors drawback which mainly focus on technology alone for storing knowledge in organization rather it should embrace the interactions between people, processes, and technology to share knowledge. These three—people, processes, and technology—all function as an integral part of the ongoing dynamics as organizations struggle to fulfill their information needs. People regards as the main actor in this interaction because it is people, not technology, who own knowledge and manage the policies, priorities, and processes that support knowledge sharing. These three aspects must be put into considerations in building OAIR in Indonesian HE.

People

Lynch (2003) and Drake (2004) mention collaboration as an essential characteristic of OAIR practice. Several studies showed OAIR implementation needs collaboration among different professions namely Librarian, technologist, faculty and leader to achieve OAIR goal. (Patsy & Branschofsky, 2003; Lam & Chan, 2007; Sutedjo, 2012). Librarian is the profession which is well known for organizing the knowledge for ease access but OAIR demands him or her to be more proactive in identifying and recruiting knowledge content of OAIR. Technologist is the profession to provide technology to maintain and make sure long preservation, user friendly software and enhance global access. Lecturer is the profession who are teaching, researching, doing community service and produce scholarly works. Leader is a position which has authority for financial, legitimate and moral support for OAIR sustainability. There must be a collaborative cooperation among different professions to have successful OAIR. Each of them has his or her own responsibility to make sure that it works well.

OAIR Process

Based upon literature review on OAIR, there are three main activities; searching potential knowledge assets which are scattered around campus; developing strategies for knowledge capturing and organizing digital documents.

A. Searching Scattered Knowledge Resources

The librarians usually are the people who have the responsibility to identify scattered knowledge resources in campus either in digital or printed format. They have to be proactive to find out those potential knowledge assets which may reside inside or outside the campus.

The following are several examples of activities deployed by academic librarians when searching for knowledge resources; identifying and contacting already-published faculty members, talking to retiring faculty members to submit their scholarly items, seeking out well-known campus authors, visiting faculty members' personal and departmental websites as well as the websites of the research centers and institutes on campus, surveying academic departments to identify working papers and technical reports; searching the library catalog to identify proceedings of conferences held inside the campus, scanning through boxes of pre-published research papers held in the University Archives, searching electronic databases and open access sources such as Web of Science and DOAJ (Directory of Open Access Journal) to identify papers published by the faculty authors, and contacting individual faculty members to ask for their complete publication lists and their full-text documents. (Dill & Palmer, 2005, Lam & Chan, 2007)

B. Developing Knowledge Recruitment Strategy

Knowledge recruitment is one of the challenges in content building of OAIR. Majority of the contribution of OAIR is expected from faculty members. Several studies showed when faculty members understand the benefit of OAIR, they would like to share their scholarly works to OAIR. OAIR needs rich knowledge content and it is not an easy task. Mark and Shearer (2006) identify the following strategies in gathering faculty scholarly items:

- **Socialization of OAIR:** Socialization of the benefit of OAIR service needs to be conducted either informally or formally and through different sources (print, online, in person). From informal encounters, face to face conversation to seminar, workshop or meeting with faculty or department members
- **Depositing Service:** This service helps authors to deposit their work by simply e-mailing their content to the library and library staff will then deposit the material. Some of the service includes checking copyright permissions, negotiating with publishers, and tracking all of this information in a database to eventually uploading the document with associated metadata.
- **Automatic Knowledge Capturing:** A few OAIRs are able to capture knowledge automatically by collecting the material themselves for example the system harvests the content from faculty and departmental websites. The academic librarian found that most authors who already had content on the web were happy to share their publications
- **Mandatory Policy:** This strategy helps to enrich knowledge content where campus community members have to submit their scholarly works. It also adds an extra legitimacy and authority when contacting authors for their papers.

C. Organizing Digital Documents:

OAIR teams have to organize digital format for assuring quality control of digital documents such as the following:

- **Name authority Control:** Contributors may have different ways in writing their names when publishing their works. It is necessary for the OAIR system to perform name authority control for consistency.
- **Versioning:** It is important to have a procedure which can differentiate among different versions of documents whether it is pre-print or post-print version.
- **Copyright:** Copyright issue is one of the challenges in developing a successful IR system. The faculty or researcher usually hesitates to submit their research outputs to IR systems, since they usually transferred the copyrights of their publications to

publisher. Librarian plays active role in assuring faculty about copyright issue. Academic librarian at HKUST Repository develops a copyright manual as guidelines for future use. The steps taken of checking documents copyright is as followed; Firstly, The IR Team surveyed the publisher's policies for the journal articles via SHERPA/RoMEO (www.sherpa.ac.uk) and publisher websites; Secondly, If the policy is unknown, the IR Team will write to the publishers for clarification and ask them for the archiving permission. (Lam & Chan, 2007)

OAIR Technological Function

Technology can be utilized to accommodate user needs to motivate users to participate and to submit their scholarly works to OAIR. Socialization of OAIR benefit to users must be in line with technology tools. If OAIR promotes self-archive then the OAIR team needs to make sure the availability of user friendly pages for submission. (Foster & Gibbons, 2005; Lam & Chan, 2007) Another approach to stimulate faculty author contribution is the availability of usage statistic. OAIR needs to be supported with technology that enables the system to work interoperable with other repositories.

Below is the illustrative figure of OAIR conceptual Model:

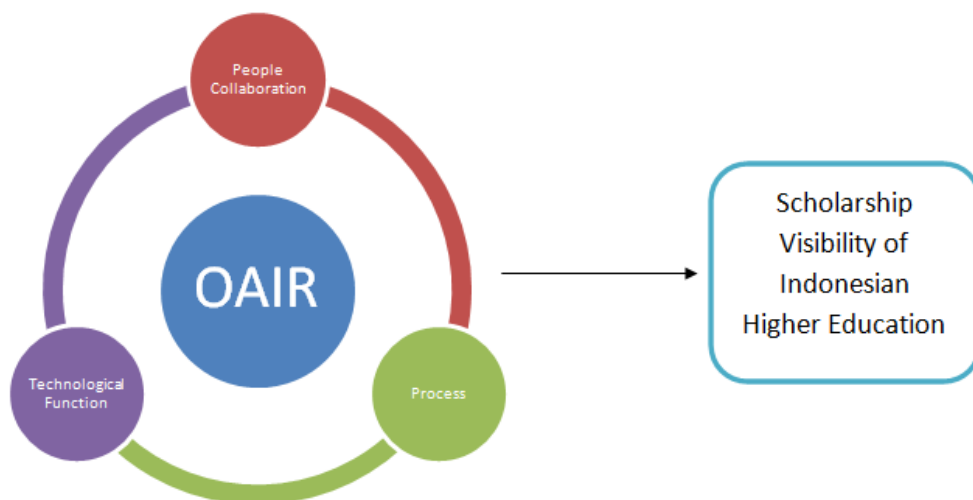


Figure 2
Conceptual Model of OAIR

OAIR BARRIERS

There are many barriers that face the spread of OAIR. Such barriers include, but not limited to lack of support from authority body – campus authority or government; shortage in qualified Human Resources in academic libraries, lack of technology specialists with knowledge in hardware and software technologies related to knowledge capturing and sharing; and lack of awareness and motivation from the faculty body and lecturers

CONCLUSION

OAIR is KM initiative in Indonesian Higher Education. OAIR objective is not only for preserving, organizing, and disseminating the local content of campus community but also to enhance visibility of HE scholarship. There are 32 OAIR appear in Repository World Web. It showed that OAIR Indonesian HE has competitive position among world repositories. Comparing with the number of HEs in Indonesia in the whole archipelago, it is still small number. However, there is a great potential of knowledge resources which needs attention to

be organized to ease of access and sharing knowledge. Open Access Institutional Repository is an alternative for scholarly communication to showed up academic works of Indonesian scholars and able to enhance scholarship visibility of Indonesian HE. A conceptual model of OAIR illustrate how people, OAIR process, technological function works in harmony to make sure that a single integrated system is available as a place to capture local knowledge content and share them to global audience. When each of those HEs contribute to a single portal, Garuda, a representative for Indonesian knowledge resources, a good network of knowledge sharing among scholars are available and hopefully culture of sharing knowledge among Indonesian scholars is growing and gives benefit to scholars and to Indonesian HE not only in national but also at international level.

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