Indonesia knowledge dissemination: a snapshot

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Abstract. The educational progress of a country or educational institution is measured through the implementation of knowledge dissemination. Evidence of knowledge dissemination has carried out be in form of the type of published document, which is based on the database of the index of scientific publications: Scopus. This paper expresses a simple form of knowledge dissemination based on document type. Although the growth of knowledge dissemination does not have the same pattern based on the appearance of document types, the general implementation is almost the same. However, maximum effort needs to be done by PTN-bh to support Indonesia knowledge dissemination.

1. Introduction
In the concept of knowledge management, the knowledge must always be available to all those who need it with the principle that the knowledge be an appropriate for the right person at the appropriate place and time [1], in order to increase public welfare [2]. Most people today get information about something for their knowledge using search engines whereby they access information resources, such as through the Web [3]. However, the Web contains not only truly reliable information, but contains other elements that undermine the welfare of society such as slander and false news. Therefore, knowledge dissemination is an approach in managing knowledge so that the right information grows faster than incorrect information [4].

Dissemination of knowledge, on the one hand, is to transfer knowledge within and across settings, so that all people that have the knowledge also to have competitiveness in their lives [5]. However, on the other hand, knowledge dissemination aims to reduce the duplication of knowledge development where the concepts, ideas, science, and technologies be overlap with each other. In addition to broadening the insight and improving the quality of ideas [6]. Today, information technology has become part of knowledge management [7], and as a medium for delivering and disseminating knowledge [8]. Various classical approaches in knowledge dissemination have been adapted for ease of administration: from registration, submit, commenting, acceptance, improvement, implementation, publishing, and recognition [9]. Therefore, the existence of knowledge development today can be seen from the existence or absence of scientific papers in trusted database. This paper aims to recognize the dissemination of knowledge based on reputable indexer databases for that scientific publications.

2. Basic Concept and Motivation
In higher education and/or research institutions, knowledge dissemination is evidence of the existence or absence of knowledge development carried out at the institution [10]. Knowledge development is done from the results of research and implementation of education, namely the output in the form of
scientific paper and patent [5]. In dissemination of knowledge, the implementation of education resulted in each participant conceptually obtaining learning, enlightenment, acquisition of new perspectives or attitudes, while from an instrumental vocational point each participant obtain modification, new practice, or expertise [6]. Therefore, knowledge dissemination has impact not only academic environment but also social through third pillar of university, that is community service with downstream task. Through downstream will be increased social awareness of every member of the community on the impact of emerging technologies. Through downstream will be enhanced the ability to make a choice based on available alternative information. In general, knowledge dissemination causes the exchange of information, capital, matter and perspective [8].

The dissemination of knowledge has different meanings for every institution, any field of knowledge and each branch of knowledge, and consequently is implemented differently by everyone [4]. Yet classically, knowledge dissemination is carried out by

a. the resource person writes the knowledge, sends it to the reader, and the reader interprets and understands it, or
b. the speaker talks with the audience, and conducts the discussion, and the audience interprets and understands it.

Although there is a possibility of discussion in the classical dissemination of knowledge, but in general knowledge dissemination takes place in one direction. Therefore, its interpretation and execution always depends on the ability of the absorber of the listener or reader [11].

Conversely, with the presence of information technology, like the Web, has caused the dissemination of knowledge into two directions directly, by which analysis can be done by audiences or readers about the truth of knowledge conveyed or transmitted [12,13]. However, the implementation of knowledge dissemination recognized in the information age involves interrelated components such as authors; committee; publisher; media: magazine, journal, proceeding, or book; reviewers; editors; and indexer. Newspapers or magazines either online or not within certain limits are recognized as scientific publications, whereas blogs in certain circumstances can be only considered as a means of knowledge dissemination. Types of recognized scientific publication media include [14]:

- **Journal** is one of the media of scientific papers recognized, is also sometimes known as periodical scientific or scientific magazine, is a form of publication that serves to register scholarly activities, certify the results of activities that meet minimum scientific requirements, disseminate widely to the public, and archive all findings of researches activities, and the scientists and the discourse that it contains. In general journal/magazine/scientific periodical is marked by ISSN (International Standard Serial Number).
- **Book** is one of the scientific works which is the result of original research or thought, in the form of reference books, monographs, or other. Generally a book has an ISBN (International Standard Book Number).
- **Proceeding** in book form are collections of scientific papers presented at conferences, seminars, or scientific meetings. Proceeding possess ISBN or ISSN.

All documents of scientific work are deemed reputable when indexed by reputable indexers and have an impact factor. Reputable indexers recognized by the Indonesia Ministry of Higher Education and Research are the Web of Science (https://clarivate.com/products/web-of-science/), Scopus (www.scopus.com), or Microsoft Academic Search (http://academic.research.microsoft.com/), while the impact factor comes from the ISI Web of Science (Thomson Reuters) or from the Scimago Journal Rank (SJR) [15]. In addition, there are some well-recognized indexers like DOAJ, CABI, Copernicus and others, but the recognition unlike the three indexing databases above. However, in the dissemination of knowledge there are various documents recognized by that criterion.
3. The Adaptive Approach
Identification of the existence of knowledge dissemination in the information age is done through information available online [16]. The recognized dissemination is evidenced by the publication of scientific paper and indexed by reputable indexer databases. The knowledge dissemination data of an institution or the country is derived from reputable indexer databases, whereas behaviour is derived by timeline (year by year) following the number of documents and types of documents published.

The types of documents that are evidence of the implementation of knowledge dissemination are as follows (http://www.bmj.com/about-bmj/resources-authors/article-types, http://retractionwatch.com/2013/02/25/is-an-article-in-press-published-a-word-about-elseviers-withdrawal-policy/ ) [17]:

- **Article** is a classic document that changes a factual essay be complete with a certain length (usually between five and twenty pages) to convey ideas and facts that can convince, educate and increase knowledge (contains full descriptions of the latest research finding original).
- **Letter** also called communications is a document containing a brief description (as information) of the latest findings that are considered urgent.
- **Note** is a document containing a brief description that is considered a bit urgent or important than a letter.
- **Review** is a document that contains the accumulation of the results (research) of different articles on a topic that is poured into a coherent narrative about state of the art of a field.
- **Editorial** is the document as the main article (leading or leader) written by senior editorial staff.
- **Report** is a document as an information article created to convey information or tell a specific event in a form that can be presented widely and researched.
- **Book** is a document consisting of a set of sheets of paper, parchments, or similar material bound in such a way as to comprise parts of the thinking for the stated subject matter.
- **Book Chapter** is a document that contains the story of something in particular, complete and finished as an intermediary for the reader.
- **Conference Paper** is a document as an article written to be accepted for oral presentation or as a poster on a scientific activity.
- **Conference Review** is a document as unpublished articles in proceedings to review issues related to the conferences.
- **Erratum** is a document containing corrections to a publication text.
- **Short Survey** is a document that explains the sampling process briefly to conduct a survey.
- **Data Paper** is a document as articles that describe dataset.
- **Abstract Report** is a document written briefly and clearly.
- **Opinion** is a document that is written as a view or statement that is not conclusive.
- **Extended Abstract** is a concise document derived from the abstract.
- **Article in Press** is an article that has been accepted for publication but may still contain errors or duplications from other publications so that article may be withdrawn from publishing, so the article does not have complete volume/issue/page information.
- **Business Article** is a document issued by mutual agreement between the author, translator, and publisher.
- **Retracted** is a document containing public statements made to withdraw previous statements.

So the line-shaped timeline, for example, contains year information on the right or top, while on the left or bottom with the document type information, or in the order of colours that make up the letter type identifier of the document type. The comparison between document types is normalized for every type document for between institutions by using similarity formulation [18].

4. A Selective Approach as Discussion
Indonesia knowledge dissemination intends to see the behaviour of knowledge dissemination from Indonesia, whole implementation activities carried out inside or abroad. This behaviour is based on the type of document published, i.e. through reputable indexing databases such as Scopus [15]: The collected data on the number of scientific publication documents per year and per document type of institution in the top rankings in Scopus. From the Scopus database, we selected the top 20 document-producing institutions from Indonesia, and selected several institutions from other countries. This is a selective approach done to obtain knowledge dissemination behaviour based on comparison. Data retrieved until 2016.

Figure 1. Pattern of Knowledge dissemination for OSU, CAoS, CUoHK, and UKM

The number of documents per year based on the type of document has affiliation of Ohio State University, Chinese Academy of Sciences, Chinese University of Hong Kong, and Universiti Kebangsaan Malaysia. All of them are used as the comparison of knowledge dissemination: Ohio State University (OSU) is a college that has produced the highest number of the Scopus-indexed documents in United State America (until August 2017), OSU has produced the article as the first Scopus-indexed document in 1880, OSU was established in 1870; Chinese Academy of Sciences (CAoS) is one of institutions which produces the largest number of Scopus-indexed scientific document (until August 2017) in China, CAoS was established in 1949 but has been discource in Scopus-indexed first scientific work of 1935 whereby CAoS as an affiliation; Chinese University of Hong Kong (CUoHK) (until August 2017) is ranked 19th in the producer of Scopus-indexed documents in China, CUoHK was founded in 1963 and produced the first Scopus-indexed paper in 1965; and then Universiti Kebangsaan Malaysia (UKM) is one of the leading universities in Malaysia, established in 1970 and produced the first paper in Scopus indexing in the same year. The pattern of knowledge dissemination development for the four different institutions abroad can be seen in Fig. 1. In general, knowledge dissemination involves publishing journals, where articles are the medium of communication to readers, and “Article” contributes most of the scientific documents of institutions. The second largest contributor to the number of scientific documents comes from conference
(scientific meetings): In OSU, 1903 had known Scopus-indexed “Conference Paper”, but CAoS was new having to Scopus-indexed “Conference Paper” in 1981. In general, conferences become the second largest contributor of Scopus-indexed documents in each institution begin 1980s. In addition, knowledge dissemination is also carried out in a variety of ways as evidenced by different types of documents: The greatest contributors to scientific documents other than articles and conference papers are “Review” and “Book Chapter”, but in the acceleration of the knowledge dissemination there will be an incomplete article like “Article in Press” the number continuous to increase in CAoS as a result of potential presence about duplication. This means that knowledge dissemination needs to be done more quickly to take the first opportunity so that the same idea be thought by others can be muted. For that reason, always the conference as the first tool used to claim an idea.

**Figure 2.** Documents type of 11 PTN-bh as representation of Indonesia knowledge dissemination.

The Indonesian knowledge dissemination snapshot is represented by all state-owned universities (Perguruan Tinggi Negeri badan-hukum (PTN-bh)): 11 institutions, i.e. Universitas Indonesia (UI), Universitas Gadjah Mada (UGM), Institute Pertanian Bogor (IPB), Institut Teknologi Bandung (ITB), Universitas Sumatera Utara (USU), Universitas Pendidikan Indonesia (UPI), Universitas Airlangga (Unair), Universitas Padjadjaran (Unpad), Universitas Diponegoro (Undip), Universitas Hasanuddin
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(Unhas), dan Institut Teknologi Sepuluh Nopember (ITS). The pattern of knowledge dissemination of each PTN-bh can be seen in Fig. 2. With the exception of ITB and UPI, the knowledge dissemination begins with the publishing of articles in journals. Article is a major contributor of Scopus-based scientific documents, and the conference papers are the second largest contributor. While in ITB and UPI, the conference papers contribute the most compared to articles in journals. The similarity of the knowledge dissemination pattern between 11 PTN-bh as illustrated in Fig. 3a, whereas the similarity of knowledge dissemination is based on the type of document for 11 PTN-bh as shown in Fig. 3b [18, 19]: The growth pattern of Indonesia knowledge dissemination is generally not the same between 11 PTN-bh, it is shown from the emergence of document types on each PTN-bh, there are only two highest similarities between USU and Unpad (0.78) or between USU and Undip (0.56). Other than that it is below 0.50. However, with the exception of ITB, USU and UPI, the growth of the Scopus-indexed document type between PTN-bh is very close to one another, for example there are several proxies worth between some of PTN-bh: Unpad and IPB, Unair and Unhas, Unair and ITS, and Unhas and ITS.

![Figure 3. Similarity between 11 PTN-bh in pattern and document type of knowledge dissemination](image)

### Table 1. Similarity between 11 PTN-bh and 4 overseas institutions.

|         | UI     | UGM    | IPB    | ITB    | USU    | UPI    | Unair   | Unpad   | Undip   | Unhas   | ITS    |
|---------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|--------|
| OSU     | 0.96   | 0.92   | 0.91   | 0.88   | 0.80   | 0.74   | 0.86    | 0.91    | 0.82    | 0.86    | 0.86   |
| CAoS    | 0.90   | 0.86   | 0.77   | 0.90   | 0.67   | 0.61   | 0.72    | 0.77    | 0.77    | 0.72    | 0.72   |
| CUuHK   | 0.88   | 0.92   | 0.91   | 0.88   | 0.80   | 0.74   | 0.86    | 0.91    | 0.82    | 0.86    | 0.86   |
| UKM     | 0.92   | 0.96   | 0.95   | 0.83   | 0.84   | 0.78   | 0.90    | 0.95    | 0.86    | 0.90    | 0.90   |

In general, all institutions have the potential to produce scientific works that are not published perfectly (Article in Press). There is no significant difference in knowledge dissemination between PTN-bh and other institutions abroad. However, some of PTN-bh has not used the maximum potential to implement knowledge dissemination, as indicated by not all type of document have become a knowledge dissemination medium, see Table 1. In addition, the dissemination of knowledge in principle should be made with the actual effort to the type of “Article in Press” document through the knowledge management, especially from the point of the author to increase the references reading related to the study being written.

5. Conclusion

Although there are differences in patterns between 11 PTN-bh in knowledge dissemination. Commonly the knowledge dissemination used media is almost identical. The type of documents that are major contributors to knowledge dissemination are articles, and then conference papers (except ITB and UPI), but other type of documents also significantly give meaning like “Review” and “Book Chapter”. The maximum effort of knowledge dissemination by involving all potentials needs to be done, but by avoiding duplication and minimum errors.
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