RESEARCHGATE DATA ANALYSIS TO MEASURE THE STRENGTH OF INDONESIAN RESEARCH

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Abstract

Academic social network is one of the social media used by the academics and researchers to communicate, collaborate, and share articles related to their works published nationally or internationally (e.g., Researchgate.net). Researchgate.net data can be used to measure the strength of research by looking at the publications of the academics and researchers.

In this paper, we describe early investigation of the publications by academics and researchers from Indonesia available at Researchgate.net. The crawler application has been used to collect the data from Researchgate.net which is developed by using web

scrapping technique. The result showed that 0.73% of the academics and researchers in Indonesia are publishing their articles nationally or internationally.

1. Introduction

Social network site (SNS) is one of the categories of the social media which is used to develop community or individual friendship (nodes). Also, it is used to communicate and/or share with each others. Social network for academics and researchers is called academic social network (ASN). ASN is a social relationship for academics and researchers connected with a system of collaboration on the web of academics social network for the research activities. Academic social network is used to connect, communicate, collaborate, and share articles of academics and researchers related to current topics of research and study projected and published papers. Researchgate.net and Academia.edu are popular sites for academics and researchers. For both the academics and researchers, the two institutions offer link and media to create complete collaboration and communication for exchange of ideas.

Researchgate.net is an institution developed in Berlin by a physician, namely Ijad Madisch in 2008. Currently, Researchgate.net has 12+ million members and 100+ publications from 193 countries covering topics, such as medicine, biology, engineering, chemistry, computer science, physics, and many others [1]. Currently, in Researchgate.net, there are 63 noble prize laureates and 86% of the members are postgraduates [1]. The academics and researchers in Researchgate.net can create and edit profiles, upload/download publications, read, comment, ask/response, follow and/or followed by the other academics and researchers. The major benefit of Researchgate.net is the feature by which the files of publications can be saved.

The use of social network in studies, such as the analysis for the society and that of geo-location has been conducted in several publications [2-4]. In the academics relationship, the use of academics social network in Indonesia is beneficial for government, and to academics and researchers for improving

the quality and quantity of their researches and publications to meet international standards. It is used as an indicator for the development of technology and science of a country. Thus, appropriate method and techniques are needed to collect publications data available in social network. The development of the crawler application using the web scrapping is one of the solutions to collect data from the academic social network site in which it is not completed with Application Programming Interface (API) services, such as Researchgate.net. Researchgate.net data use to analyze collaboration between students and advisors in the publication matter, share the publications, and communicate among the academics and researchers and measure the link of scholarship [5, 6]. Social network analysis through the community detection can function to know existing structures of academics and researchers in Indonesia and see the map of research tendency in Indonesia through publications of the articles. Therefore, the goal of this work is to know the strength mapping of Indonesian researches and publications exist in academic social network Researchgate.net. This research is just used as a basis of measurement for the publications of academics and researchers in Indonesia and is independent of Researchgate.net. The mapping is based on the topics of research, profiles of the academics and researchers, university/faculty, and collaboration between the academics and researchers.

2. Research Methodology

The use of social network academic Researchgate.net data is considered by having community detection method that applied into a system of applications on software developed to answer questions related to research, namely the way to gather data of academics and researchers from the site of Researchgate.net and to know the strength of the map of Indonesian researches and publications. The collection of data is made by using crawler application which is automatic in collecting the data from Researchgate.net through authentication process. The result of collection is saving into data base. The crawler application has been developed and integrated to analyze the data to be an integrative system. The space of the system can be seen in

Figure 1. Based on the system, the development activities have been divided into steps, namely: (1) data collection, (2) data warehouse, (3) process and analysis [To have the process and advanced analysis, it is needed to apply and implement gathering algorithm and have a method to produce the comprehensive result and information. This phase is used to apply community detection method and algorithm of local seed expansion [7]. The results from this process is saved into database], and (4) application layer.
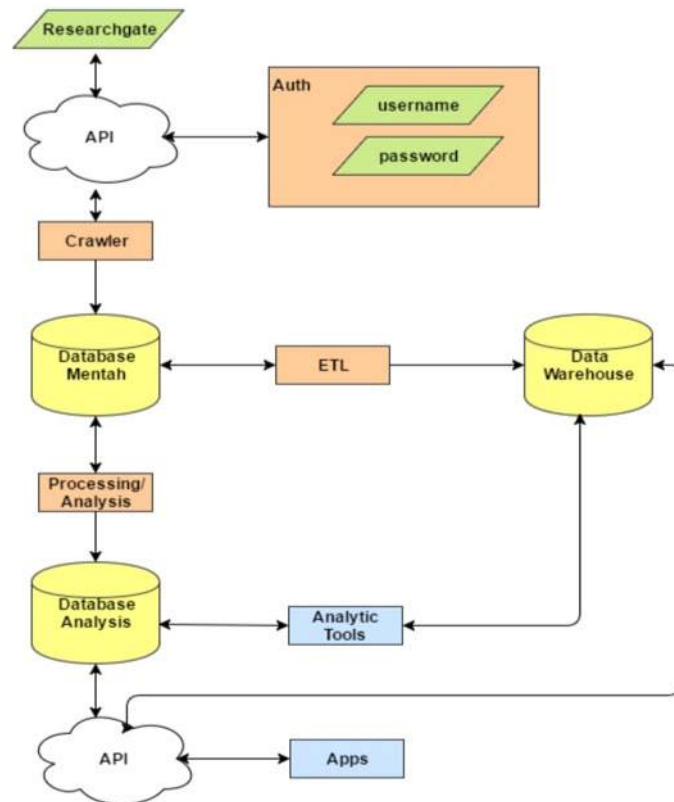

Figure 1. The space of the system in community detection for academic social network.

Social network analysis conducted by using Researtgate.net data is beneficial for dataset that represented the research tendency in Indonesia. The process of research that has been conducted followed several steps, namely: (1) collecting data, (2) storing data, (3) analyzing data, and (4)

visualizing data. The process of collecting data is conducted during January 1st - February 28th, 2017.

3. Result and Discussion

The collected data has turned out to be the data set saving into database through many tables, namely: data user, data institution, data department, data topic, data skill, data discipline, data publication, data project, data citation and data followers and the process is known as the second step, named storing data.

Table 1. Data of academics and researches in Indonesia at Researchgate.net

No.	Types of the data	Total record of data
1	Data user	596634
2	Data institution	1410
3	Data department	345
4	Data topic	47810
5	Data skill	33919
6	Data discipline	15228
7	Data publication	4401
8	Data project	33919
9	Data citation	1641
10	Data followers	9605

The third step is data analyzing. It is conducted to describe data gathering from statistical collection.

By using the crawler application, the data showed that there were 1410 colleges/universities which used Researchgate.net as media for communication, collaboration, and sharing the articles through 596634 users from 4445 colleges/universities in Indonesia by September, 1st 2016 (source: Dikti). From the publications with a total 4401, it showed that the tendency of academics and researchers' publications is low. From the user data of academics and researchers in Indonesia, there was only 0.73% published

work based nationally or internationally. Out of these 1641 articles were quoted. The value 0.73% had been taken from the percentages of publications per data user (academics and researchers in Indonesia) available on the site of Researchgate.net.

The fourth step is data visualizing. The visualization is conducted by looking table of database from the storing data as can be seen in Figure 2.
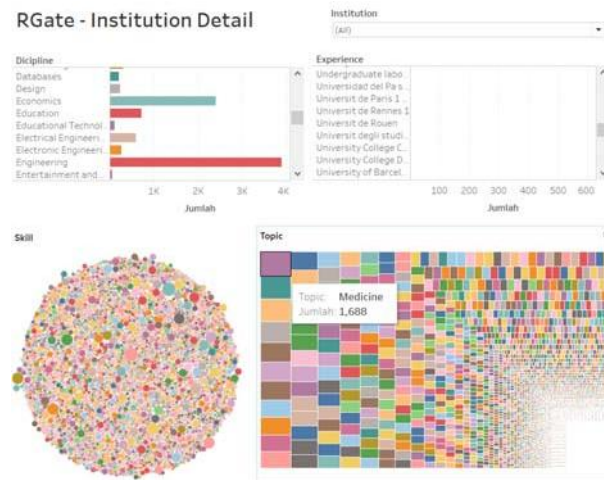

Figure 2. Indonesian institution detailed data.

Conclusion

Researhgate.net data analysis has been conducted following four steps of processing, namely, collecting data, storing data, analyzing data, and visualizing data. This showed that the strength of research and publications in Indonesia is low.

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