

Visualization of Lecturer Education and Research Data (case study of Informatics Engineering Lecturer IIB Darmajaya)

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Abstract— *Lecturers who are qualified and competent in their fields are needed to encourage the quality of higher education. One way that can be done is by conducting research. Research in higher education is directed at developing science and technology, as well as improving the welfare of the community and the competitiveness of the nation. As time goes by, the research conducted by lecturers of the informatics engineering study program is increasing. This causes the processing and retrieval of certain information takes a long time. Currently data processing only uses Microsoft Excel so that the available information is more difficult to understand. The information to be processed is data visualization of education and research data by lecturers of the informatics engineering study program at The Institute Informatics and Business Darmajaya. Therefore, visualization using Google Data Studio is needed to make it easier for someone to understand the existing data and information. based on trials of making educational data visualization and lecturer research using Google Data Studio, it produces data in attractive graphic form so that the data and information displayed are easily understood by readers.*

Keywords—*visualization, Research data, Google Data Studio.*

I. INTRODUCTION

Universities have lecturers whose job is to guide students in various majors. To encourage the quality of higher education, qualified and competent lecturers are needed in their fields. There are many ways that can be done to improve the competence of lecturers, one of which is by conducting research. Research is one of the lecturers' efforts to remain

relevant and develop in their field of competence. This is regulated in the law of the republic of indonesia number 12 of 2012 article 45 concerning higher education. Paragraph 1 of the article states that research in higher education is directed at developing science and technology, as well as improving the welfare of the community and the competitiveness of the nation.

Research conducted by lecturers of the study program informatics engineering IBI Darmajaya now increasing continuously, making it difficult to process data. A lot of existing data and increasing complexity make the processing and retrieval of certain information takes a long time.. Currently, lecturer research data processing is only using Microsoft Excel. However, due to the limited features of Microsoft Excel and the increasing number of data, and the increasing number of data makes the information more difficult to understand. Based on the existing problems, it is very necessary to visualize the education and research data of lecturers, especially the study program informatics engineering using Google Data Studio. Google Data Studio is a cloud-based program designed as an easy-to-use tool to represent complex data sets in an attractive and clear way (Fernando, 2018). The core function of Google Data Studio is to display visuals such as dashboards from social media and web analytics such as Google AdWords and YouTube analytics, but with the support of MySQL and Google Sheets it shows that the program can be used by researchers to interpret their own data in an equally attractive and interesting format. user friendly (Snipes, G. 2018). The ability of Data Studio researchers to monitor and visually represent mdata can be useful for businesses and communications or anyone working with data. In addition, users look for dynamic ways to present data or deal with data. a. Data visualization can help people to understand the significance of data by placing data in a visual context. The

results of data visualization are expected to make it easier for someone to understand the existing data and information.

In a previous research entitled *Designing and Making Data Visualization of Internal Research Funds and LPPM Dikti Grants*, Multimedia Nusantara University, it was found that with data visualization, the existing information can be understood in a shorter and easier time because the information is packaged in various colored diagrams. and attractive shapes. Easy-to-see information makes the decision-making process easier (Loka and Natalia, 2019).

I. METHOD

A. lecturer

Government Regulation of the Republic of Indonesia number 37 article 1 concerning lecturers states that: lecturers are professional educators and scientists with the main task of transforming, developing and disseminating science, technology and art through education, research, and community service.

Lecturer performance is something produced by lecturers in achieving responsible and quality performance (Suryaman and Hamdan, 2016)

B. Research

Research is an effort to develop knowledge, develop and test theories. In relation to knowledge development efforts, there are five steps for developing knowledge through research, namely: (1) identifying research problems, (2) conducting empirical studies, (3) replicating or repeating, (4) integrating (synthesising) and reviewing, and (5) using and evaluating (Dan and Abu Achmadi, 2016).

C. Visualization

Data visualization is the same as communicating, the success or failure of communication is determined by how the speaker conveys the information given to the communication partner. Good visualization is certainly focused, provides clear answers, and is not too detailed. To achieve good visualization, a data visualization process is carried out (Ahmad Syaripul and Mukharil Bachtiar, 2016).

D. Cloud Computing

Cloud Computing is a promising new computing paradigm and is a future technology that provides many computing services that have never been experienced before. A Cloud Computing model infrastructure setup is usually known as a Cloud. Here are some of the categories of services available from a Cloud.

SaaS is a service for using a provided application – the service provider manages the platform and infrastructure that runs the application.

PaaS is a service for using the provided platform – developers focus on the applications they build without thinking about maintaining the platform.

IaaS is a service to use the infrastructure that has been provided (May Lenawati and Hani Atun Mumtahana, 2018)

E. Google Cloud Storage

Google Cloud Storage is a service product from Google that allows you to easily store, access, and protect data. With

Google Cloud Storage, users can store and manage access to any amount of data, whether for individuals or groups.

Google Cloud Storage allows users to store, retrieve, share, and analyze data without worrying about maintenance, upgrading or downgrading, or upgrading hardware and firmware.

Google Cloud Storage is a service product that is devoted to developers as a medium for storing very large data. This service allows you to create a file sharing service, video sharing or photo sharing very easily without thinking about how to build a server infrastructure.

F. Research Stages

The research stages describe the flow of the research from the beginning to the end of the research. This research was carried out in several stages which can be seen in Figure 1.



Fig. 1. Stages of Data Visualization Research

F. Research Data

TABLE I. The data sources used in this study were obtained from data published on the SINTA website (<https://sinta.ristekbrin.go.id>) for the last five years. The data can be seen in table 1.

TABLE I. RESEARCH DATA

Data Dosen S1 Teknik Informatika IBI Darmajaya				
No	Nama Dosen	Pendidikan	Scoopus	Google Scholar
1	Suhendro Yusuf Irianto	S3	4	49
2	Sri Lestari	S3	4	119
3	Joko Triloka	S3	3	35
4	Chairani	S3	6	22
5	Isnandar Agus	S2	0	60
6	Amnah	S2	0	3
7	Nisar	S2	0	3
8	Riko Herwanto	S2	0	11
10	Septilia Arfida	S2	0	16
11	Yuni Arkhiansyah	S2	0	3
12	Fitria	S2	18	120
13	Hariyanto Wibowo	S2	0	12
14	Yulmaini	S2	3	48
15	Sulyono	S2	0	12
16	Rionaldi Ali	S2	2	10
17	Rahmalia Syahputri	S2	0	7
18	Tri Wahyuni	S2	0	0
19	Hary Sabita	S2	0	0
20	Yuni Puspita Sari	S2	0	16
21	Rio Kurniawan	S2	1	41
22	Ketut Artaye	S2	0	5
23	Triowali Rosandy	S2	0	30
24	Suci Mutiara	S2	0	0
25	Muhammad Fauzan Azima	S2	2	27
26	Siti Nur Laila	S2	1	4

a.

G. Data Analysis Method

The data analysis method in this research is to design visualization using Google Data Studio. The stages of data analysis using Google Data Studio are as follows:

- Sign up for a Google Data Studio account
- Sign in using a previously used E-mail
- Prepare data to be visualized
- Change data format in Google Sheet form
- Visualize the data that will be displayed using several features available in Google Data Studio.

III. RESULTS

A. Results

Based on the design that has been done, the making of data visualization of lecturers' education and research using Google Data Studio produces data in the form of attractive graphics so that the data and information displayed are easily understood by readers.

B. Making Data Visualization

- Data on the number of lecturers, and Lecturer Education for Undergraduate Informatics Engineering IBI Darmajaya Study Program using the chart score card feature



Fig. 2. Data on the number of lecturers

- Using the table feature in displaying data on lecturers' names and lecturers' education, for Data Visualization Research Stages to find out lecturer information.

Pilih Nama Dosen			
Nama Dosen	Pendidikan S1	Pendidikan S2	Pendidikan S3
1. RIO KURNIAWAN	Universitas Telkom	Universitas Gadjah Mada	-
2. ISNANDAR AGUS	Universitas Sriwijaya	Universitas Indonesia	-
3. HARY SABITA	Universitas Lampung	Institut Informatika Dan Bisnis...	-
4. RIKO HERWANTO	Universitas Gunadarma	Institut Informatika Dan Bisnis...	-
5. FITRIA	Universitas Ahmad Dahlan	Universitas Gadjah Mada	-
6. NISAR	Sekolah Tinggi Sains Dan Tek...	Institut Teknologi Bandung	-
7. YUNI ARKHIANSYAH	STMIK Akakom	Universitas Gadjah Mada	-
8. JOKO TRILOKA	STMIK Akakom	Institut Teknologi Bandung	Universiti Brunei ...
9. SUHENDRO YUSUF ...	Institut Pertanian Bogor	Universitas Indonesia	University Of Bra...
1.. SULYONO	Institut Informatika Dan Bisnis...	Institut Informatika Dan Bisnis...	-
11. RIONALDI ALI	Institut Informatika Dan Bisnis...	Institut Informatika Dan Bisnis...	-
1.. YULMAINI	Institut Informatika Dan Bisnis...	Universitas Gadjah Mada	-
13. MUHAMMAD FAUZ...	Institut Informatika Dan Bisnis...	Institut Informatika Dan Bisnis...	-
14. HARIYANTO WIBO...	Institut Informatika Dan Bisnis...	Institut Informatika Dan Bisnis...	-

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Fig. 3. Lecturer Education Data

- Using the google maps chart feature in displaying the location of lecturers' education in pursuing undergraduate, postgraduate, and doctoral education.

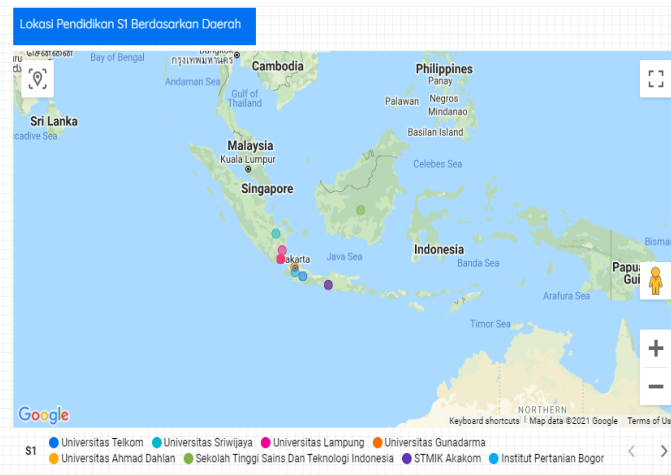


Fig. 4. Location Map of Lecturer S1 Education

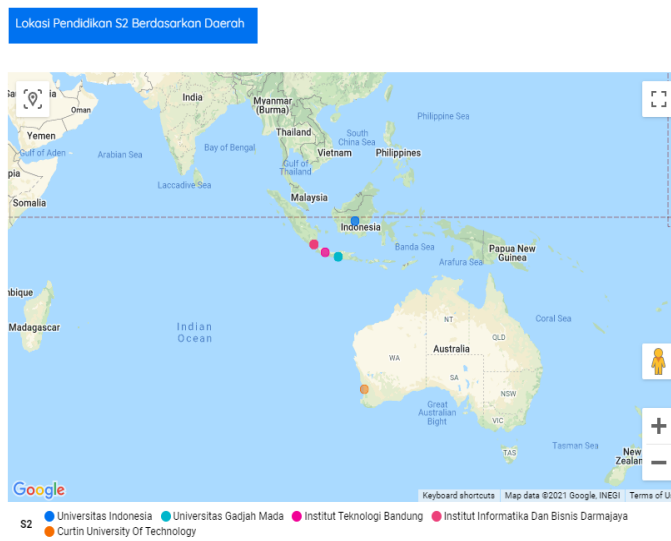


Fig. 5. Location Map of Lecturer S2 Education

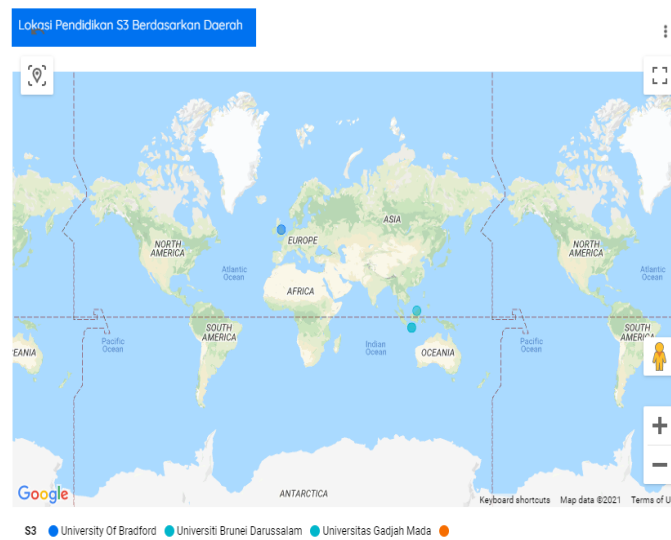


Fig. 6. Location Map of Lecturer S3 Education

- Displays data on lecturers in Informatics Engineering, the number of lecturer data, the number of Scopus data, the number of WOS data, and the amount of scholar data using the chart score card feature.

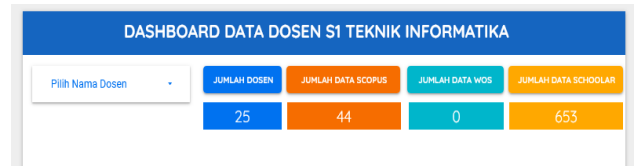


Fig. 7. Research Data for Undergraduate Informatics Engineering Lecturers

- Displays data on lecturers' names and Scopus data as a whole using the chart line feature

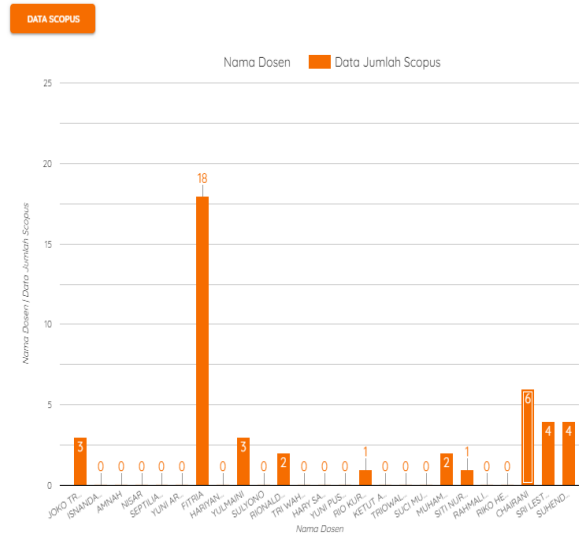


Fig. 8. Diagram of Total Data Scopus Lecturer of Informatics Engineering

- Displaying data on lecturers' names and Scopus data as a whole starting from 2017 to 2021 using the chart line feature.

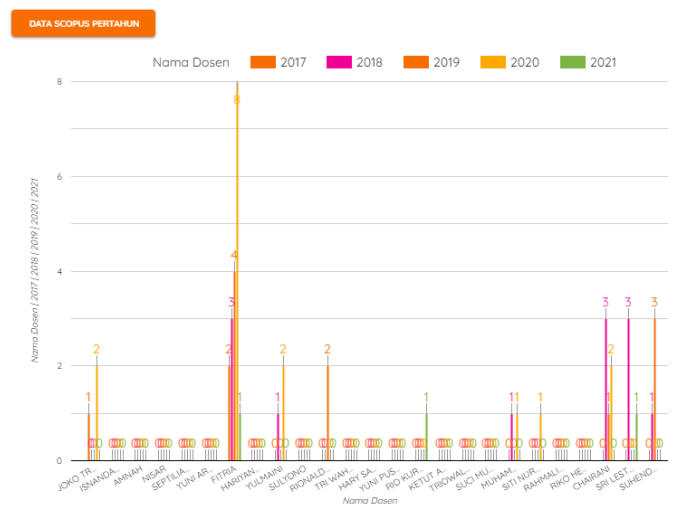


Fig. 9. Annual Scopus Data Diagram for Informatics Engineering Lecturer

- Displays data on lecturers' names and overall Google Scholar data using the chart line feature.

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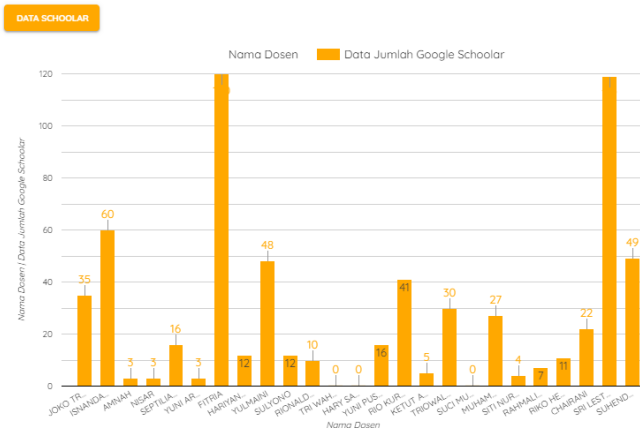


Fig. 10. Total Data Diagram of Google Scholar Informatics Engineering Lecturer

- Displaying lecturer name data and google scholar data as a whole starting from 2017 to 2021 using the chart line feature.

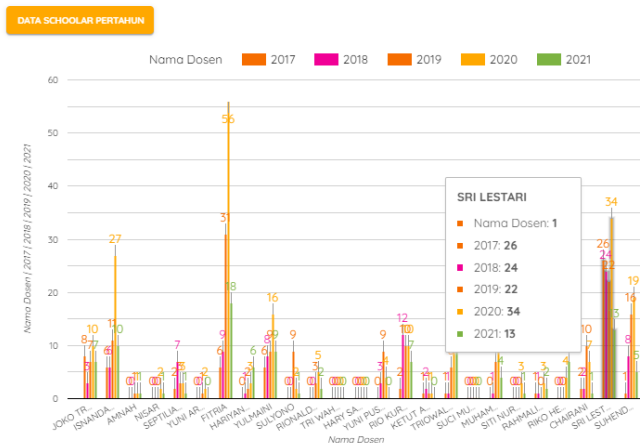


Fig. 11. Data Diagram of the Informatics Engineering Lecturer Annual Google Scholar

IV. CONCLUSION

The data used is obtained from the SINTA website with 25 lecturers, 44 Scopus researches, 653 Google Scolars. Lecturers of the informatics engineering study program are dominated at the postgraduate education level. Based on the data visualization design created using Google Data Studio, it produces data in the form of attractive graphics so that the data and information displayed are easily understood by readers. However, this research still has many limitations, namely the data used is not real-time (static). Suggestions for further research are to use real-time data so that the data displayed is the updated (latest) data.