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Digitalization of tracer study data through the utilization of looker studio

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Abstract: Tracer studies are a key indicator of higher education quality that must be monitored regularly to support timely decision-making. However, not all universities have interactive digital media to present tracer study results in real time, which limits their usefulness. One university lacking this capability is the State Islamic University (UIN) Raden Mas Said Surakarta. UIN Raden Mas Said Surakarta should digitize its tracer study report results to make them more interactive, dynamic, and valuable for policy decisions. Therefore, this study will examine the digitization of tracer study data at the Fakultas Ilmu Tarbiyah, UIN Raden Mas Said Surakarta, to produce an interactive digital media that presents tracer study results in real time. This research was conducted with a descriptive quantitative approach, where the interactive digital media created was a data visualization dashboard built using the Looker Studio platform. The results showed that the developed dashboard was able to present tracer study information at the FIT UIN Raden Mas Said Surakarta interactively and comprehensively, enhancing decision-making capabilities.

Keyword : data visualization dashboard, looker studio, tracer study

1. Introduction

Tracer Study is required annually at every university to track alumni who graduated 1–2 years prior, with results reported to the Ministry of Education and Culture. These results, ideally in digital form, allow universities to evaluate alumni absorption and learning processes, making follow-up actions easier in today's era of big data.

Currently, not all universities, including UIN Raden Mas Said Surakarta, report tracer study results digitally. Relying on printed reports makes updates difficult and limits the usefulness for decision-making. Therefore, digital reporting is necessary for dynamic and actionable results.

Digitization is the process of converting data and information into digital form [1]. Digitization of tracer study reports is the process of converting them into digital form. The forms of digitization of tracer study reports can vary, for example, by uploading them to a university website, converting them into attractive visualization dashboards, and so on.

Data visualization is a way of communicating data through visual representations [2]. Data visualization has the advantage of facilitating data understanding and interpretation, as well as attracting attention [3] One platform for creating data visualizations is looker studio. The advantage of this platform is that the data visualization produced is more interactive and easier for users to use [4].

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Based on the above description, this study will create a dashboard in looker studio to visualize the results of the tracer study at UIN Raden Mas Said Surakarta, especially in Fakultas Ilmu Tarbiyah and to know about user's perception about this dashboard. The existence of a tracer study report in digital form, embodied in a visualization dashboard, is expected to display interesting information from alumni data and be dynamic, allowing tracer study data collection at any time and with results that change as data is added.

2. Methods

This research was conducted using a quantitative approach with the following stages:
1. Planning
2. Developing Data Collection Instruments
3. Data Collection
4. Creating a Data Visualization Dashboard
5. Evaluation

The planning stage is the initial stage of the research. It involves developing data collection methods and developing the initial design for the data visualization dashboard. At this stage, it was determined that the alumni to be traced would be limited to those from the Fakultas Ilmu Tarbiyah (FIT) at UIN Raden Mas Said Surakarta, and that alumni data would be collected via WhatsApp blasts. The visualization dashboard for the tracer study report was planned to include pages displaying the distribution of alumni participation by study program, the distribution of alumni domicile, and alumni data after graduation, aligned with the Ministry of Education and Culture's instrument. At this stage, data collection instruments were also planned, referring to the Ministry of Education and Culture's instrument.

The instruments used in this study were open-ended and closed-ended questionnaires, the contents of which were aligned with the Ministry of Education and Culture's tracer study instrument. The questionnaires were created using the Google Forms platform. Data collection was conducted using the WhatsApp platform by sending multiple messages, or "blasts." The data visualization dashboard was created using the looker studio platform, using a variety of graphics, including maps, bar charts, and pie charts. Evaluation was used to verify that the created data visualization dashboard displayed data correctly and consistently.

The theory that used in this research are explain in point 2.1, 2.2, and 2.3.

2.1 Definition of tracer study

A tracer study, or alums tracking study, is a systematic research tool for examining the transition of college graduates from education to the workforce. Muhammad et al define tracer studies as a key factor in enhancing the quality of higher education through data and information derived from alumni feedback [5]. This study is designed to provide helpful information for evaluating higher education outcomes, which can then be used to enhance quality assurance in higher education institutions.

In the context of quality assurance, tracer studies play a strategic role across multiple dimensions. Putra et al emphasize that tracer studies serve as a tool for measuring the

extent to which universities have succeeded in producing graduates who benefit society [6]. The results of tracer studies can be used to improve and enhance quality assurance in higher education institutions, including evaluating the relevance of the curriculum to the needs of the job market, the effectiveness of the learning process, and the contribution of higher education institutions to the development of graduate competencies.

2.2 Data Digitalization

Digital transformation in the context of higher education refers to the integration of digital technology into all aspects of institutional management to improve operational efficiency and strategic decision-making. Dhameria et al. explain that digital transformation significantly impacts managerial efficiency and accessibility in higher education, with information technology acting as an enabler in improving the operational and strategic performance of institutions [7].

Data-driven decision-making (DDDM) is a decision-making process based on facts and evidence from data, rather than relying solely on intuition or personal opinion. Avan et al. define DDDM as a structured approach that promotes quality decision-making by: (a) defining themes using policy and health systems frameworks, (b) reviewing data to identify problems, (c) considering alternative options, (d) prioritizing based on values, and (e) using a consultative process to develop, commit to, and follow up on action plans [8].

Haryanti et al. emphasize that digital transformation in higher education requires a framework that addresses technical, cultural, and strategic dimensions to ensure holistic institutional transformation [9]. The Digital Maturity Model framework is used to assess institutional readiness in technology, data, processes, and strategy, enabling institutions to identify gaps and prioritize improvements.

Neri et al. in their systematic review of data visualization in AI-assisted decision-making highlighted that data visualization improves user understanding by reducing information overload and helping decision-makers interpret and analyze complex data [10]. Specific visual elements such as the use of color, symbolic representation, and data density control were identified as essential to improving user understanding and supporting effective decision-making.

2.3 Looker studio

Google Looker Studio (formerly known as Google Data Studio) is a cloud-based data visualization and reporting platform provided free of charge by Google. Oktaviani and Damayanti concluded that Google Looker Studio is an effective and efficient tool for visualizing student data in secondary schools, which not only aids in data processing and analysis but also supports faster, evidence-based decision-making [11].

Key Features. This platform offers a comprehensive range of features that support robust data visualization. Apriani et al. identified that Google Data Studio provides a variety of graphic formats, including geographic maps, bar graphs, pie charts, and interactive tables, allowing users to customize visualizations to their specific needs [12].

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The ability to design report layouts before implementation allows users to manually sketch on paper to plan their desired data visualizations.

3. Results

This is results of tracer study data visualization using looker studio. Figures 1, 2, 3, 4, and 5 below present the design for the digitization of the Fakultas Ilmu Tarbiyah's tracer study data visualization using looker studio.

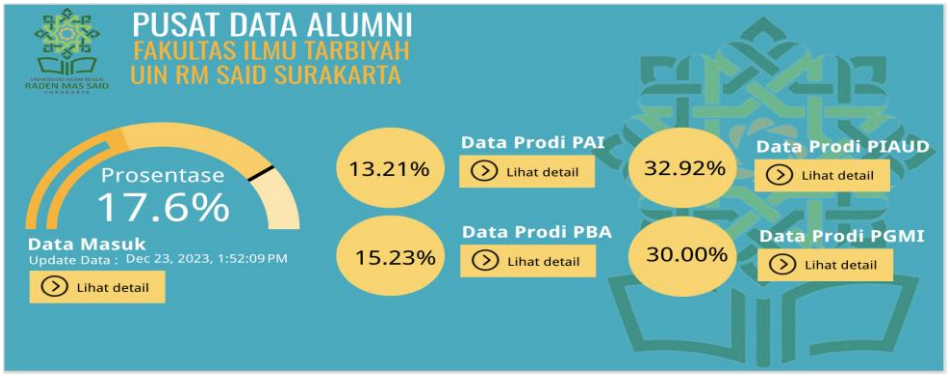

Figure 1. Display of the Incoming Tracer Study Data Reporting Page

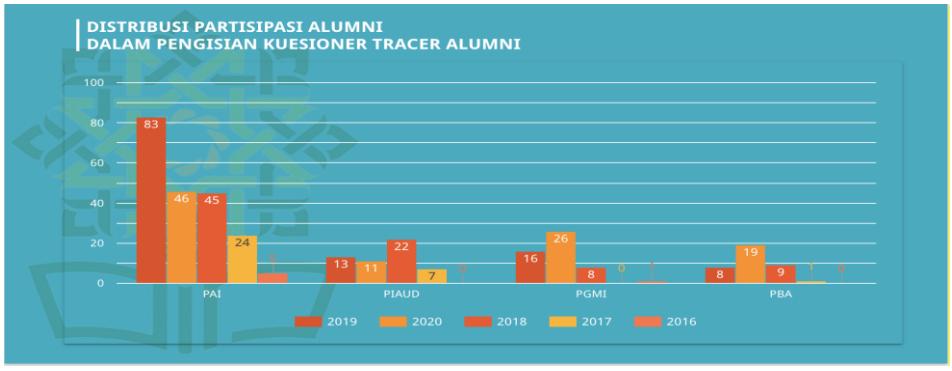

Figure 2. Display of the number of respondents for each study program

Figure 3. Display of distribution of graduates' domiciles

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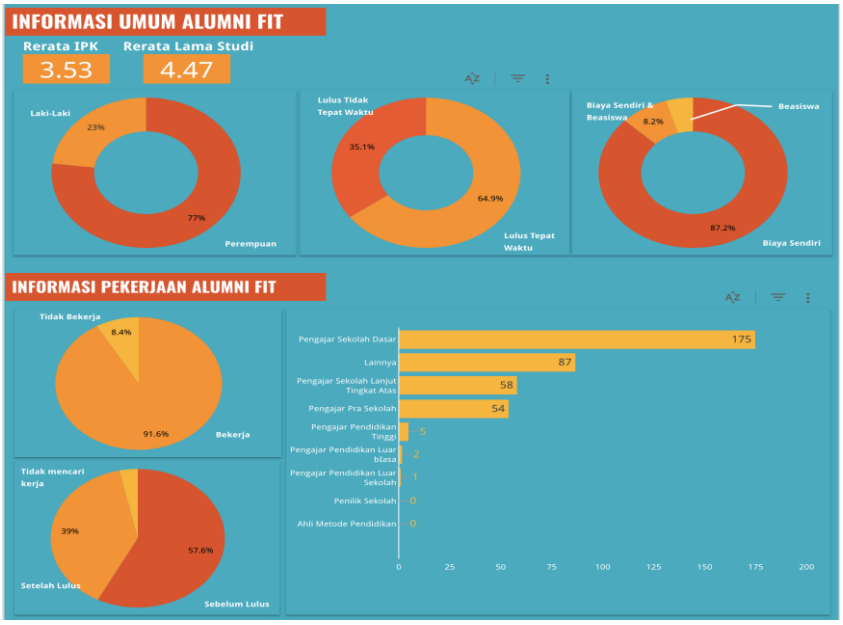

Figure 4. Display of graduate activities after graduation

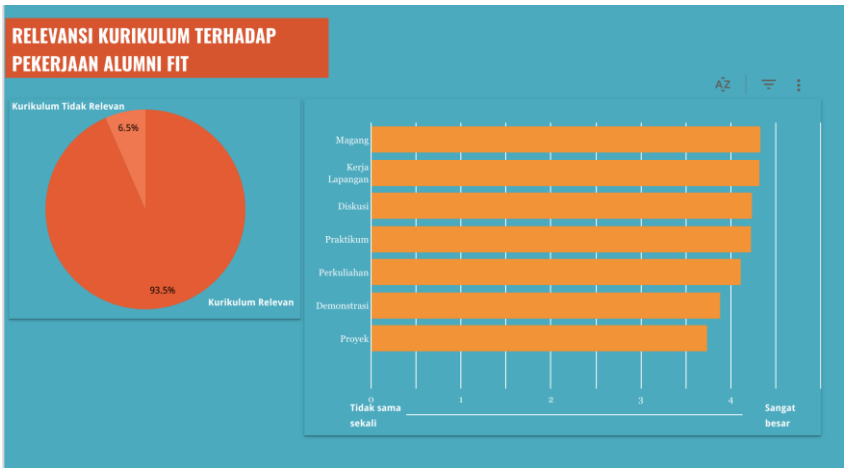

Figure 5. Display of relevance of curriculum to the world of work

The results of user's prespection about dashboard that measured from the usefulness, ease of use, and sustainability of digitizing tracer study data through visualization using looker studia are as follows.

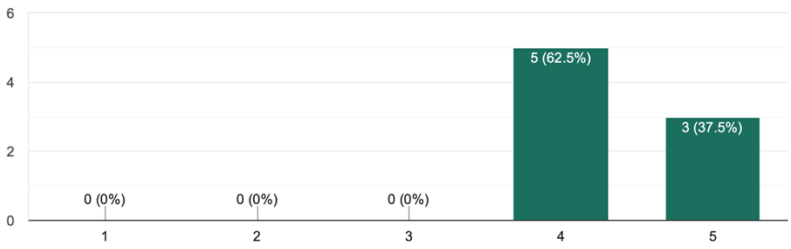

Figure 6.
Percentage of respondents' assessment of the usefulness of digitizing tracer study data assisted by looker studio

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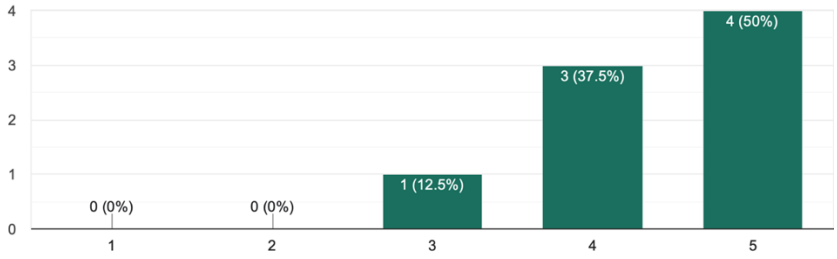

Figure 7. Percentage of respondents' assessment of the ease of digitizing tracer study data assisted by looker studio

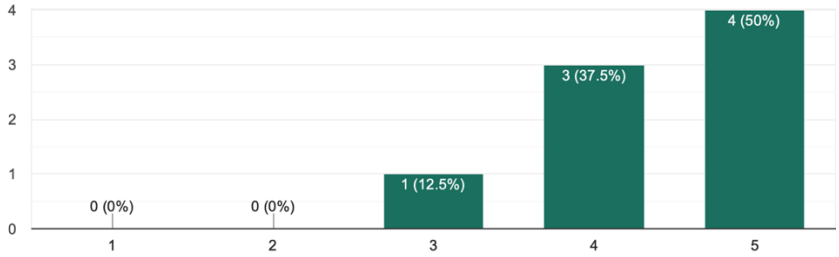

Figure 8. Percentage of respondents' assessment of the sustainability of the use of digitization of tracer study data assisted by looker studio

4. Discussion

Based on the results obtained, the tracer study data digitization design using looker studio is sound and comprehensive, though it may not capture all nuanced data aspects. As seen in Figure 1, the tracer data digitization utilizes a visualized percentage tool. This design allows users to obtain information regarding the number of graduates who have completed the study questionnaire, both out of the total target and within each study program.

Figure 2 depicts the tracer study data digitization as a bar graph, which illustrates the differences in the number of graduates who completed the tracer study questionnaire for each study program and each year of graduation. Figure 3 uses a map to illustrate the domicile distribution of Faculty of Islamic Studies graduates, helping stakeholders feel connected to the data's real-world relevance. This domicile distribution information can be useful for junior students in their databases when they are seeking internships or jobs.

Figures 4 and 5 are dominated by pie and bar graphs, which provide a comprehensive overview of key graduate data. Figure 5 demonstrates that the looker studio digitization provides information on average GPA, average length of study, gender distribution, punctuality at graduation, sources of funding, and graduate activities after graduation. This thorough presentation can help stakeholders feel confident in the data's depth and usefulness for strategic planning. Furthermore, Figure 5 also presents information about the close relationship between education and the workplace.

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Digitizing tracer study data using looker studio will facilitate quick access to information about the graduates' performance, making your work more efficient. The results of this analysis are reinforced by research conducted by Devi et al., which states that digitizing tracer study data assisted by Microsoft Power BI makes tracer study information easy to understand and in accordance with stakeholder needs [13]. Furthermore, this digitization will make the data more engaging for users, as it is presented in graphical form. Digitizing tracer study data will also support your efforts in developing strategies to improve or remediate aspects of the learning process in study programs that have not yet been achieved.

To enhance the meaning of this digitization, the results of this digitization were evaluated by collecting data on potential users' perceptions of ease, usefulness, and sustainability of use. In terms of usefulness, the majority of users stated that digitization has been beneficial for managing tracer study data, as indicated by 62.5% of users giving it a score of 4 and the remainder giving it a score of 5. This supports previous findings that data visualization dashboard improve decision-making efficiency and help users interpret information more effectively [14]. Regarding ease of use, 12.5% of users gave it a score of 3. Similar observations were noted in studies highlighting the role of digital literacy in shaping dashboard usability and user confidence [15]. This means that not all users are able to utilize the digitized tracer study data. However, in terms of sustainability of use, 12.5% of users still gave it a score of 3. Literature suggests that long-term system adoption depends on consistent data quality and adequate user support mechanisms [16].

Alongside a closed-ended questionnaire, an open-ended survey was created to gather honest feedback on usefulness, ease of use, and sustainability. Users suggested creating video tutorials to support their use of the system and improving data completeness, which helps us tailor future enhancements to better meet your needs.

5. Conclusion

The research results show that the developed dashboard is capable of presenting tracer study information interactively and comprehensively. Data visualization is displayed through a map showing the distribution of graduate domiciles, a box showing the average length of study to illustrate the efficiency of the educational period, and a pie chart representing the relationship between employment and academic fields. Additionally, a filter box enables users to select specific study programs, empowering them to explore data tailored to their needs. This dashboard not only facilitates data access but also provides strategic significance: institutions can monitor graduate distribution patterns, evaluate study duration, and assess the relevance of the curriculum to the needs of the workforce. Thus, the dashboard serves as a data-driven decision-making tool that can be used for study program development and overall educational quality improvement. In addition, when viewed from the perspective of usefulness, ease and sustainability of use, almost all users have given a fairly good assessment of the digitalization of tracer study data through data visualization in looker studio.

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