



TADAKU: Application of Research Questionnaire Collection as an Effort to Increase the Quantity and Quality of Research in Indonesia

Muhammad Fadhli Taqdirul Jabbar^{1*}, Inggo Iwan Kurniawan², Fuji Rahmannisa², Indira Syawanodya¹

¹Software Engineering, Universitas Pendidikan Indonesia, Indonesia

²Elementary School Teacher Education, Universitas Pendidikan Indonesia, Indonesia

*Correspondence: E-mail: fadhlijabbar@upi.edu

ABSTRACT

Data is crucial in today's modern society. One of the most effective ways to obtain data is through online surveys using online questionnaires. However, there is a lack of online questionnaire creation applications that can motivate respondents to participate in surveys. As a result, survey creators often face difficulties in obtaining responses from respondents. The Tadaku application is designed to address this issue by providing a platform for survey creators to create questionnaires and helping them to reach targeted respondents quickly and accurately by implementing a reward system for participants who are willing to complete the questionnaires. Thus, the Tadaku application provides motivation and benefits for respondents. The questionnaire app system is developed using the waterfall method, which consists of four stages: needs analysis, system design, coding, system testing, and maintenance. The features available in the Tadaku questionnaire application include registration, creating new questionnaires, questionnaire completion, and point redemption for cash rewards.

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1. INTRODUCTION

Research is an important thing in finding, understanding, and solving a problem or realizing a goal. In Indonesia, students have a crucial role in industrial development, which involves their participation in research and the emergence of new discoveries for the benefit of society (Muliani et al., 2021). Considering the importance of research, efforts to enhance research in Indonesia for both academics and the general public need to be pursued.

The Indonesian Institute of Sciences (LIPI) as a research institution in Indonesia has experienced a decline in productivity in publishing research results, indicating that the quality of research in Indonesia is still inadequate (Rosa, 2020). The quality of research, which is determined by innovation and novelty, is one of the contributing factors to this issue. Indonesia lacks high innovation in research (Setiawan and Lenawati, 2020). This is evident in the Global Innovation Index (GII) report in 2018, where Indonesia ranked 85th with a score of 29.8. Moreover, within ASEAN, Indonesia is ranked second to last (Aurelia and Etikariena, 2021). Additionally, scientific journals published by researchers and academics in Indonesia, which determine the quality of research, are relatively low. Most scientific publications are only published in Scopus or intermediate-level international journals (Aisah, 2021).

According to data analysis from Scimago Journal and Country Rank, the quantity of Indonesian research from 1996 to 2020 ranked 45th out of 240 countries, with a total of 212.806 publications. Compared to the United States, which ranked first with 13.817.725 publications, the number of journal publications from Indonesia is relatively low (Ha et al., 2020).

Efforts to improve the quality and quantity of scientific research publications in Indonesia include providing greater research opportunities for researchers in the country (Rohmah and Kusmintardjo, 2016). In relation to this, the ease of accessing information, obtaining data, and archiving can be facilitated through digital technology (Marquest and Ferreira, 2020). Therefore, a digital platform that can facilitate research is needed to simplify the data acquisition process for Indonesian researchers.

In research, one way to gather data is through questionnaires (Primasari, 2016). Questionnaires are research instruments consisting of a series of written questions aimed at obtaining data from specific groups of people through direct or indirect interviews, such as using questionnaires (Rasdiana et al., 2016). In the modern era, questionnaires can be conducted online through specific applications or websites (Ismail and AlBahri, 2019). This allows surveys to be conducted more effectively, as the data obtained can be automatically managed and stored digitally.

However, there is currently no application that can facilitate the creation and distribution of questionnaires for research purposes. Therefore, an innovative solution is needed to develop an application that can serve as a platform for questionnaires and simultaneously increase motivation for academics to conduct research. Such an application should also provide several advantages compared to existing questionnaire creation applications, including ensuring the accuracy of data obtained from questionnaire distribution and providing benefits to the general public who are not directly involved in research.

2. METHOD

This website-based application is designed using the SDLC (Software Development Life Cycle) waterfall method. This method is a software development model that consists of several systematic and sequential stages, similar to a waterfall (Prasetijo et al., 2016). Each

stage needs to be completed before proceeding to the next one. Through this method, it is expected that the application development process can be done effectively. Another term for the SDLC waterfall model is the sequential linear model or classic life cycle (Pricillia, 2021). The SDLC waterfall method consists of five stages: requirements analysis, design, coding/code generation, testing, and maintenance/support stages (Dharmawan et al., 2018), as depicted in Figure 1.

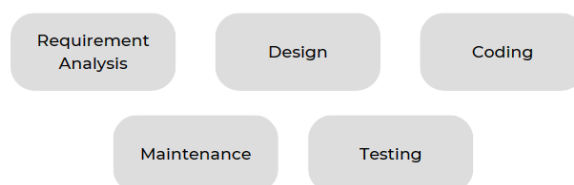


Figure 1. SDLC waterfall method stages.

2.1. Analysis stage

In this stage, intensive gathering of requirements for the creation and development of the Tadaku application is carried out. Additionally, analysis is conducted regarding user requirements, such as the interface design of the application (Khan and Kumari, 2021). Based on the analysis, several aspects are identified as necessary for the design of the Tadaku application, including input data and available features in the User Interface (UI). The input data requirements for the application include user account information, such as username, user email, user password, and other user identification details based on valid data from an identification card or similar document.

2.3. Design stage

The design phase of the application development involves defining various aspects of the application, including architecture, components, interfaces, and other characteristics, by transforming user requirements into software packages (Sahu et al., 2014). This process serves to create a comprehensive overview of the application, which serves as the foundation for its construction. The design phase encompasses the creation of architectural design, data design, interface design, and procedural design of the application. Its objective is to generate a holistic understanding of the application, providing a basis for its development.

2.4. Code stage

In this phase, the design is integrated into the software program using a programming language (Rachmatullah et al., 2020). The programming or coding activities for the Tadaku application are performed by writing program scripts using the PHP (Hypertext Preprocessor) programming language, while data management is carried out using the MySQL database.

2.5. Test stage

Testing is performed using Black Box Testing, which tests the compatibility of components against specifications by creating test cases that are then tested by testers or potential users (Putra et al., 2020). Meanwhile, in White Box Testing, the compatibility of components with

the application design is tested by verifying input and output flows through the application (Irawan, 2017).

In this phase, user testing is also conducted with several users to determine the effectiveness of the Tadaku application in performing assigned tasks. Users provide feedback as evaluations to make improvements to the application. Market testing is carried out by promoting the Tadaku application through various social media platforms to reach people from different backgrounds, ensuring its usefulness for the community in various fields.

2.6. Maintenance

This phase is carried out after the implementation of the Tadaku application, which includes the utilization of the application system, auditing, maintenance, and continuous improvement of the Tadaku application system (Aswati et al., 2017). If there are any changes to the software, maintenance is performed, which may involve revisiting the development process starting from the analysis of specifications for existing software changes, but not for creating new software. In this phase, efforts are made to enhance the system development related to software and hardware that will be used.

3. RESULTS AND DISCUSSION

3.1. Application name and logo

The Research Questionnaire Application is named Tadaku, which can be accessed at www.tadaku.id. The logo design and its philosophy are displayed in **Figure 1**.



Figure 1. Research questionnaire application.

The color composition used in the Tadaku application logo, along with their respective color codes, includes blue (#54A3E2) and yellow (#FFC569). The philosophy behind the Tadaku application logo is represented by a lowercase letter "t" that resembles a pot and a plant. The letter "t" symbolizes the initials of the name Tadaku. The curved shape at the bottom of the letter "t," resembling a pot, signifies a container or receptacle to hold questionnaires that can be useful in research studies. The modified shape at the top of the letter "t," resembling a leaf and stem of a plant, symbolizes that research activities can be beneficial to life, similar to how plants contribute to our lives.

3.2. Application feature and interface

The Tadaku application has reached the finalization stage. As for the user interface, it has been successfully created. The features of the Tadaku application are described in the following **Table 1**.

Table 1. Application feature.

No	Feature Name	Function
1	Home	The homepage of the TadaKu application features buttons for "Sign Up Now," "About," "Terms and Conditions," "Privacy Policy," "FAQ," "Login," and "View Other Questionnaires." It includes a description of the TadaKu application, video tutorials for usage, testimonials, office address, help and guides, developer contacts, and TadaKu's social media presence.
2	About	TadaKu's brief and development team.
3	Terms	The application TadaKu displays the terms of service, cookies policy, license agreement, hyperlinks to TadaKu content, iFrame, content responsibility, reservation terms, link removal, and disclaimer.
4	Privacy Policy	It contains several policies that have been created by the TadaKu team to be agreed upon by users.
5	FAQ	List of frequently asked questions and answers.
6	Sign Up	Create a new account for users.
7	Log In	It is intended for users to log in to the application.
8	Forgot password	Reset password for users.
9	Create Questionnaire	Create a new questionnaire.
10	Fill Questionnaire	Users can fill out questionnaires.
11	Exchange point to balance	Redeem points into balance.
12	Exchange point to currency	Exchanging points for money (transferring them to a bank account or digital wallet).

3.3. Application workflow

In the TadaKu application, users who have an account can play the role of surveyor or respondent. To create a questionnaire, users must first fill in information about the questionnaire and then distribute it. As a surveyor, users can set the reward points to be given to respondents who are willing to fill out their questionnaire and set the questionnaire completion time. On the other hand, users can become respondents by filling out the questionnaires that appear on their dashboard. The questionnaires displayed on each user's dashboard will vary. This is because the TadaKu application automatically suggests questionnaire types to users based on the compatibility between the user's educational/work background and the questionnaire criteria. After completing the last question, users can click the finish button to end the questionnaire and earn points. Users can use these points to create questionnaires or exchange them for money, with a minimum threshold of 1000 points, which equals Rp10,000. The money can be withdrawn to various available e-wallets (DANA, OVO) or the user's bank account (BNI, BNI Syariah, BRI, BRI Syariah, BJB, and others)

based on the user's preference. The working mechanism of the Tadaku application can be seen in **Figure 2**.

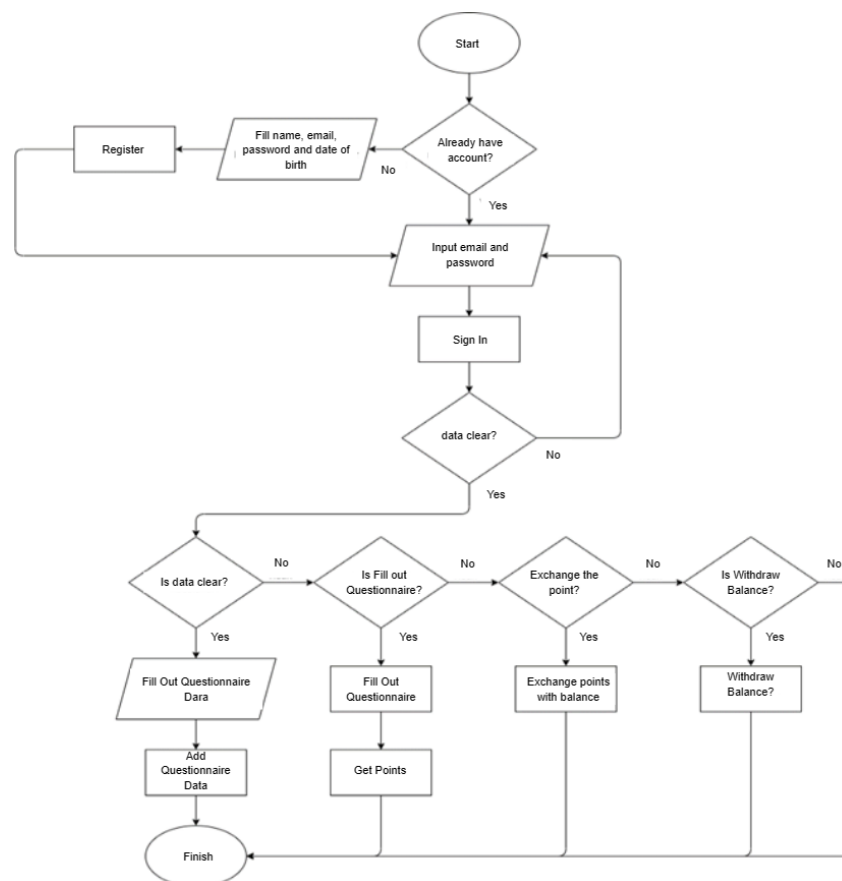


Figure 2. Application workflow flowchart.

4. CONCLUSION

Tadaku is an innovative application that uses a point system to motivate respondents to complete questionnaires provided by surveyors. This ensures that the desired number of respondents for a questionnaire can be quickly achieved. The accumulated points can be exchanged for balance and then converted into e-money through various available e-banking services or digital wallet applications, according to the user's preference. Users of the Tadaku application, both as respondents and surveyors, can exchange these points. This advantage is not yet possessed by other questionnaire creator applications. Therefore, besides assisting in questionnaire completion, Tadaku can also provide additional income for the community. If further developed, Tadaku has the potential to become a national digital startup. Some other advantages and benefits of using the Tadaku application include bringing surveyors and respondents together in one place/platform, helping surveyors conduct research by quickly and accurately distributing online questionnaires, motivating respondents to fill out the available questionnaires, having an integrated reward system with e-banking and e-wallet for money exchange, ensuring data credibility, potentially serving as a social media platform for academics, and potentially improving the quality and quantity of research in Indonesia.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirm that this paper is free of plagiarism.

6. REFERENCES

- Aisah, S. (2021). Efektivitas mind mapping dalam membentuk kecakapan abad 21 dan kemandirian belajar di masa pandemi. *INSTRUKTUR: Jurnal Pendidikan Guru Madrasah Ibtidaiyah*, 1(1), 1-9.
- Aurelia, F. Z., and Etikariena, A. (2021). Apakah pemberdayaan pembelajar dapat mendukung kemampuan inovatif mahasiswa? Pengujian korelasional dan komparatif. *Persona: Jurnal Psikologi Indonesia*, 10(1), 16-32.
- Aswati, S., Ramadhan, M. S., Firmansyah, A. U., and Anwar, K. (2017). Studi analisis model rapid application development dalam pengembangan sistem informasi. *MATRIK: Jurnal Manajemen, Teknik Informatika dan Rekayasa Komputer*, 16(2), 20-27.
- Dharmawan, W. S., Purwaningtias, D., and Risdiansyah, D. (2018). Penerapan metode SDLC waterfall dalam perancangan sistem informasi administrasi keuangan berbasis desktop. *Jurnal Khatulistiwa Informatika*, 6(2), 159-167.
- Ha, C. T., Thao, T. T. P., Trung, N. T., Van Dinh, N., and Trung, T. (2020). A bibliometric review of research on STEM education in ASEAN: Science mapping the literature in Scopus database, 2000 to 2019. *Eurasia Journal of Mathematics, Science and Technology Education*, 16(10), 1-11.
- Irawan, Y. (2017). Pengujian sistem informasi pengelolaan pelatihan kerja UPT BLK Kabupaten Kudus dengan metode whitebox testing. *Sentra Penelitian Engineering dan Edukasi (SPEED)*, 9(3), 59-63.
- Ismail, I., and AlBahri, F. P. (2019). Perancangan e-kuisisioner menggunakan codeigniter dan react-js sebagai tools pendukung penelitian. *Jurnal Sains Komputer dan Informatika (J-SAKTI)*, 3(2), 337-347.
- Khan, I. A., and Kumari, D. (2021). The role of analysis phase of SDLC for small scale business application-a review. *International Journal of Humanities, Engineering, Science and Management*, 2(1), 63-75.
- Marquest, I. C., and Ferreira, J. J. (2020). Digital transformation in the area of health: systematic review of 45 years of evolution. *Health and Technology*, 10(3), 575-586.
- Muliani, A., Karimah, F. M., Liana, M. A., Pramudita, S. A. E., Riza, M. K., and Indramayu, A. (2021). Pentingnya peran literasi digital bagi mahasiswa di era revolusi industri 4.0 untuk kemajuan Indonesia. *Journal of Education and Technology*, 1(2), 87-92.
- Putra, A. P., Andriyanto, F., Karisman, K., and Harti, T. D. M. (2020). Pengujian aplikasi point of sale menggunakan blackbox testing. *Jurnal Bina Komputer*, 2(1), 74-78.
- Prasetijo, L. H., Syah, F., Wibowo, S. H. S., Ardanu, F., and Utami, E. (2016). Penerapan pendekatan model waterfall dalam pengembangan sistem e-rapor. *Jurnal Teknologi Technoscintia*, 9(1), 39-47.

- Pricillia, T. (2021). Perbandingan metode pengembangan perangkat lunak (waterfall, prototype, RAD). *Jurnal Bangkit Indonesia*, 10(1), 6-12.
- Primasari, N. H. (2016). Faktor-faktor yang mempengaruhi kepatuhan wajib pajak orang pribadi yang melakukan pekerjaan bebas. *Jurnal Akuntansi dan Keuangan*, 5(2), 60-79.
- Rachmatullah, R., Kardha, D., and Yudha, M. P. (2020). Aplikasi e-commerce petshop dengan fitur petpedia. *Go Infotech: Jurnal Ilmiah STMIK AUB*, 26(1), 24-36.
- Rasdiana, E., Muhamad, F. N., and Kurniaji, R. (2016). Pemanfaatan rinfo form sebagai media pembuatan kuesioner dalam proses pengumpulan data pada perguruan tinggi. *Technomedia Journal*, 1(1), 78-94.
- Rohmah, N., AY, M. H., and Kusmintardjo, K. (2016). Strategi peningkatan kemampuan dosen dalam penulisan karya ilmiah (studi multi kasus pada Unisda dan Staidra di Kabupaten Lamongan). *Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan*, 1(7), 1312-1322.
- Rosa, S. A. S. (2020). Partnership dalam produktivitas publikasi hasil penelitian di lembaga ilmu pengetahuan Indonesia. *Jurnal Administrasi Publik*, 11(1), 75-91.
- Sahu, K., Shree, R., and Kumar, R. (2014). Risk management perspective in SDLC. *International Journal of Advanced Research in Computer Science and Software Engineering*, 4(3), 1247-1251.
- Setiawan, D., and Lenawati, M. (2020). Peran dan strategi perguruan tinggi dalam menghadapi era Society 5.0. *Journal of Computer, Information System, and Technology Management*, 3(1), 1-7.