Enhancing user experience: An accessibility and usability study of an open government data portal.

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Abstract. Government organizations initiate digital transformation by using online platforms to facilitate the dissemination of open government data (OGD) to the public. Despite the government's effort to increase citizens' willingness to participate in the OGD initiative, there is a possibility that citizens may encounter challenges accessing the OGD through open government data portals (OGDP). This study aims to assess the effectiveness of user interface (UI) and user experience (UX) design in Satu Data Indonesia (SDI), the Indonesian national OGDP. The research question guiding this study is "How does user experience influence willingness to use OGDP?" We follow a quantitative approach to gain an understanding of the OGDP usability and users' willingness to engage with the OGD. First, an experiment will examine participants' access to SDI portal. Second, a survey will investigate whether the participants are willing to use OGD based on their experience engaging with OGDP. This study will enhance our understanding of OGDP usability within the context of developing countries and evaluate whether user experience influences future usage willingness. Ultimately, the findings will benefit governmental entities in improving their OGDPs' usability and user experience.

Keywords. open government data, open government data portal, OGDP, UI/UX design, accessibility, usability.
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1. Introduction

Open government data (OGD) comprises two components: open data, which is characterized as data freely available for use, repurposing, and dissemination (Open Knowledge Foundation, 2012), and government data, which is defined as data generated by government organizations (Ubaldi, 2013). By providing access to government data, the government promotes and enacts a participatory and collaborative policy process (Soegiono, 2018). The OGD movement aims at increasing the availability and accessibility of government data, encouraging government organizations to publicly disseminate their data on open government data portals (OGDP). This movement was initiated in the United States in 2009, with the issuing of the Open Government Directive, mandating federal agencies to open government data for openness, participation, and collaboration (The White House, 2009). Later, it became a global trend among governmental entities. Using OGDPs illustrates the actualization of both open government initiatives and digitization for disseminating government data and information with technology (Sari et al., 2024).

Previous studies have discussed OGDP in different regions, including Asia (Saxena, 2019; Shao et al., 2021; Wang et al., 2023; Warraich & Rasool, 2023), Europe (de Juana-Espinosa & Luján-Mora, 2019; Kapoor et al., 2015), America (Begany et al., 2021; Oliveira et al., 2016; Paige & Freund, 2019), and combinations among different

regions (Máchová et al., 2018; Molodtsov & Nikiforova, 2024; Mutambik et al., 2021; Nikiforova, & McBride, 2021; Sheoran et al., 2023). However, few studies examining OGDP from the user interface (UI) and user experience (UX) design perspective in emerging countries. This study, focusing on Indonesia, addresses this literature gap by using a quantitative approach to answer the following research question, "How does user experience influence willingness to use OGDP?"

This study deepens the understanding of OGDP usability and users' challenges of OGDP access. Moreover, it enriches current literature on OGD in developing countries. Finally, the findings can guide government organizations to improve OGDP usability and ultimately increase the willingness to use OGD. This study is structured as follows: the following section provides a literature review, the third section describes the methods, and the last section discusses the conclusion and future work.

2. Literature Review

2.1 Usability and the adoption of OGDPs

OGD initiative is characterized by free government data access and use. This initiative has attracted many scholars' interest in the adoption, challenges, and impact of using it. The existing literature has addressed OGDP adoption and its association with usability. For example, Shao and colleagues (2021) shows that the perceived utility and ease of use deterine user's intention to use an OGDP. It indicates a willingness to engage with OGDPs when its use is beneficial and user-friendly. Similarly, Kapoor and colleagues (2015) shows that the less complicated an OGDP is to use, the easier it is to adopt, which can be assessed by the time required for searching OGD datasets. In short, the willingness to engage with OGDPs is positively associated with its benefits and user-friendliness.

2.2 Usability features of OGDPs

Previous studies discuss various OGDP usability features. First, numerous studies emphasize dataset access, including searching and filtering capabilities on OGDPs for dataset discoverability (Máchová et al., 2018; Oliveira et al., 2016). Additionally, when users cannot locate the needed OGD, OGDP must offer adequate assistance to contact government employees; otherwise, it may hinder OGDP usage. The government can enhance the assistance features, such as incorporating online functions (Wang et al., 2023). Second, readability is crucial. Indeed, as indicated by Warraich and Rasool's (2023) assessment of the Pakistan OGDP, poor readability impedes users' ability to read and comprehend OGDP content.

Third, visualization and analytic tools on OGDPs are necessary (Máchová et al., 2018; Mutambik et al., 2021; Saxena, 2019). Lastly, active interactions and communications with users and stakeholders are crucial since government's capacity to facilitate interactivity on OGDPs affects the ease of use (Sheoran et al., 2023). Users would use OGDPs when the government provides sufficient channels for interactions and gives feedback (Shao et al., 2021). Indeed, Nikiforova and McBride (2021) discovered that the most deficient OGDP usability characteristic includes lacking capabilities for interactions between OGD users and providers. Interactions can be strengthened by providing feedback forms features, including forums, contact forms, ratings and comments, and dataset requests (Mutambik et al., 2021). Various variables can measure OGDP interactivity, such as pageviews, number of sessions, and the duration of user interaction with the portal (Begany et al., 2021).

2.3 UTAUT model and the research framework

This study evaluates the usability of SDI (https://data.go.id/), the Indonesian national OGDP, and the factors of user experience influencing behavioral intentions to use OGDPs. The previous study indicated that behavioral intention to utilize technology may influence the use of OGD (Sari & Gascó-Hernández, 2024). Since the OGDP is considered an assisting technological platform, we employed the Unified Theory of Acceptance and Use of Technology (UTAUT) model to inform our research. In addition to four key determinants of UTAUT (effort expectancy, performance expectancy, social influence, and facilitating conditions), this study also examines moderating factors: gender, age, and education, which are defined as demographic characteristics of the participants (See Figure 1).

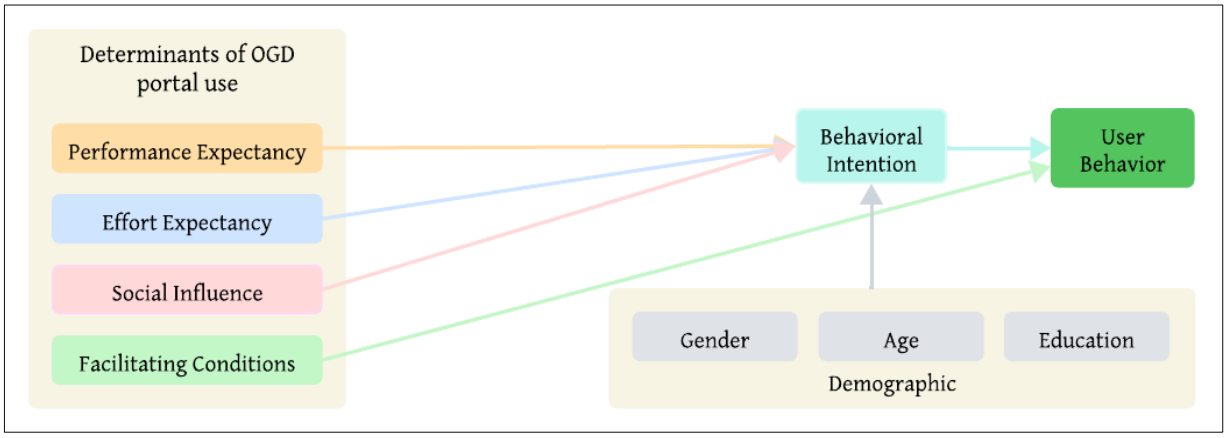

Fig. 1 – Research Framework extending the UTAUT model (Venkatesh et al., 2003)

3. Methods

3.1 Case study

The Indonesian government launched its OGD initiative in recent years. In June 2019, the President of Indonesia issued Presidential Regulation Number 39 of 2019 on Satu Data Indonesia, which requires all levels (national, provincial, and local) of Indonesian government organizations to release current, accurate, and accountable data through SDI. Since the launch of SDI portal in December 2022 (Iman, 2022), the new policy has trickled down to regional governments. Following the implementation of OGD initiatives at the national level, government organizations at various levels followed suit and launched their regional OGDPs (Sari, 2020).

3.2 Research Design

We employ two methodologies to address our research question (See Figure 2). First, a usability experiment requires the participants to follow the provided instructions and access SDI portal. Participants will play the researchers seeking OGD datasets across three provinces in Indonesia to support their research. One type of OGD users are students (Crusoe et al., 2019; Davies, 2010; Lassinantti et al., 2019; Talukder et al., 2019; Zainal et al., 2019). This study will recruit participants from graduate schools, as graduate students are more likely to possess the data literacy necessary for effective OGD use, aligning with the target population of this study. Participants will access the OGD datasets on SDI portal and answer questions in a session lasting for one hour.

After the experiment, a survey questionnaire will measure participants' willingness to use OGD based on their experiences with the portal. The survey consists of five sections, with 25 questions assessing participants' attitude to the statements with a 4-point Likert scale (strongly agree to strongly disagree). The performance expectancy inquiries assess whether utilizing OGDP assist with finding needed datasets. The effort expectancy questions evaluate the ease of use of SDI portal. The social influence section investigates whether social networks promote participants' use of OGDP. Finally, the facilitating conditions section investigates whether participants need the knowledge and guidance for utilizing SDI portal.

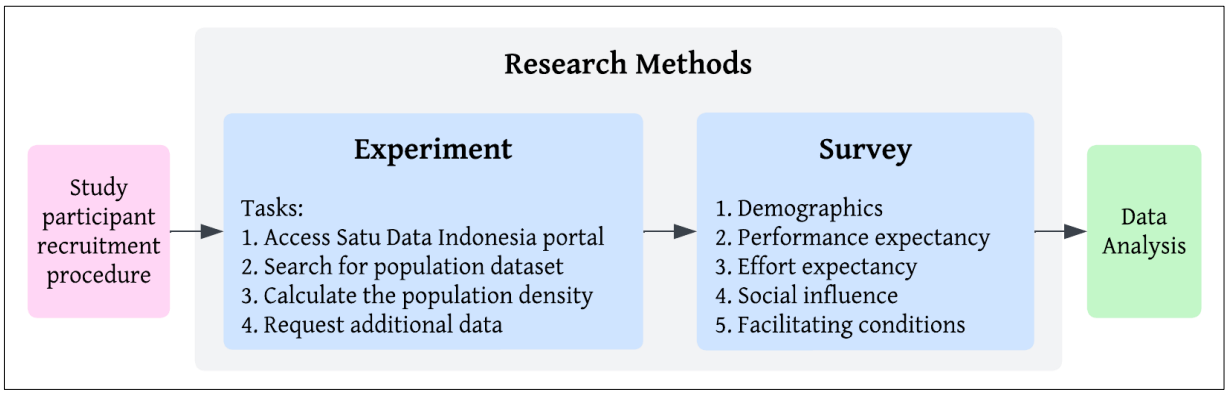

Fig. 2 – Procedure

4. Conclusion and future work

Limited OGD research analysed the situations in emerging countries when studying OGDP usability and the effect of user experience on the willingness to use OGDPs. This study addresses this gap by starting to focus on emerging countries with a case study on SDI portal. The OGDP usage experiment and the user experience survey in the subsequent phase seek to determine whether the experienced accessibility and usability influence future willingness to use OGDPs. Ultimately, the findings will provide empirical insights informing OGDP designing guidelines, enhancing OGDP UI/UX, thereby improving user experience and engagement, which boost the willingness of OGD use.

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