JURTEKSI (Jurnal Teknologi dan Sistem Informasi) ISSN 2407-1811 (Print)
Vol. XI No 4, September 2025, hlm. 763 – 770 ISSN 2550-0201 (Online)
DOI: http://dx.doi.org/ 10.33330/jurteksi.v11i4.4186
Available online at http://jurnal.stmikroyal.ac.id/index.php/jurteksi

USE OF TASK-CENTERED SYSTEM DESIGN IN THE INTERFACE DESIGN OF THE POPULATION DEMOGRAPHIC DATA INFORMATION SYSTEM

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Abstract: The rapid development of information and communication technology has prompted the government to provide digital-based services, including in the management of demographic data. This study aims to apply the Task-Centered System Design (TCSD) method in designing the Muara Enim Regency Demographic Data Information System. The TCSD method was chosen to ensure that the prototype design process was systematic and focused on user needs and tasks. The research stages included identification, user-centered needs analysis, scenario-based design, and walkthrough evaluation. The designed prototype supports several main tasks, including viewing demographic statistics, searching for specific data, submitting data download requests, and contacting the admin. The evaluation was conducted through online usability testing using the Maze platform with the System Usability Scale (SUS) instrument involving 13 respondents. The evaluation results showed an average SUS score of 78.5, which falls into the "good" category. This confirms that the interface design has met usability standards, is user-friendly, and is capable of supporting user needs in accessing and managing demographic data. Thus, the application of the TCSD method has proven to be effective in producing an interface design that is focused on user tasks and can be the basis for further system development.

Keywords: system usability scale; task centered system design; user interface

Abstrak: Perkembangan teknologi informasi dan komunikasi saat ini telah berkembang dengan pesat, hal tersebut mendorong pemerintah untuk menyediakan layanan berbasis digital, termasuk dalam pengelolaan data demografi kependudukan. Penelitian ini bertujuan untuk menerapkan metode Task-Centered System Design (TCSD) dalam merancang Sistem Informasi Data Demografi Kabupaten Muara Enim. Metode TCSD dipilih untuk memastikan proses perancangan prototipe berlangsung secara sistematis dan berfokus pada kebutuhan serta tugas pengguna. Tahapan penelitian meliputi identifikasi, analisis kebutuhan berpusat pada pengguna, perancangan berbasis skenario, serta evaluasi walkthrough. Prototipe yang dirancang mendukung beberapa tugas utama, antara lain melihat data statistik demografi, mencari data spesifik, mengajukan permintaan unduh data, serta menghubungi admin. Evaluasi dilakukan melalui pengujian usability secara daring menggunakan platform Maze dengan instrumen System Usability Scale (SUS) yang melibatkan 13 responden. Hasil evaluasi menunjukkan nilai rata-rata skor SUS sebesar 78,5 yang termasuk kategori "baik". Hal ini menegaskan bahwa rancangan antarmuka telah memenuhi standar kegunaan, bersifat user friendly, serta mampu mendukung kebutuhan pengguna dalam mengakses dan mengelola data demografi. Dengan demikian, penerapan metode TCSD terbukti efektif dalam menghasilkan desain antarmuka yang terarah pada task pengguna dan dapat menjadi dasar untuk pengembangan sistem lebih lanjut.

Kata kunci: antarmuka pengguna; system usability scale; task centered design

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INTRODUCTION

In the rapidly evolving digital era, technology has become an inseparable part of everyday life [1]. The use of information technology is expected to provide convenience in data management and the delivery of public services [2]. A structured and organized data system plays a crucial role for various institutions and organizations, including the management of demographic data.

The management of population demographic data is one of the issues that requires information technology for its resolution, due to the vast amount of data and continuous updates. Population demographic data refers to information about the condition of a population, which is used to assist in formulating national development planning [3]. The process of recording such data is carried out by collecting population registration data, which involves the continuous recording of vital events experienced by individuals [4].

Population demographic data serves as an essential foundation for planning and implementing policies across various sectors, such as education, health, and infrastructure. By accurately understanding population growth and distribution, the government can manage resources efficiently, identify regions that require special attention, and design development programs that align with the needs of society [5].

The Department of Population and Civil Registration (Disdukcapil) of Muara Enim Regency is a regional government agency responsible for providing administrative population services within the Muara Enim area. Disdukcapil is an authorized institution that delivers services related to population events, vital occurrences, as well as the management and presentation of population data [6]. These data include documents related to population events, such as birth certificates, population biodata records, population certificates, and other related documents [7]. In carrying out these responsibilities, Disdukcapil of Muara Enim Regency requires a demographic data management system to efficiently organize and process such demographic information.

At present, the management of demographic data is still performed manually. This manual process often results in inaccurate information and prolonged processing times due to a system that is less intuitive, difficult to use, and lacks integration. Additionally, slow data access and limited features hinder the efficiency of data processing. Therefore, Disdukcapil of Muara Enim Regency requires a population demographic data management system. This system would facilitate the management of population demographic data and enable the identification of the number of residents or voters in a specific district or village. Moreover, it would also allow the generation of other types of information, such as demographic statistics [8].

Therefore, this study was conducted to design a population demographic information system by applying the Task Centered System Design (TCSD) method to ensure that the user interface prototype design process is carried out systematically and in alignment with user needs. Task Centered System Design (TCSD) is a method within the field of Human-Computer Interaction (HCI) that focuses on analyzing user tasks and requirements in the design process [9].

A user-friendly system plays an important role in increasing technology

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acceptance and user satisfaction levels [10]. Therefore, interface design determi nes whether the user experience or user interaction with the system will be easy or difficult [11]. After conducting discu ssions with the Department of Population and Civil Registration (Disdukcapil) of Muara Enim Regency, it was found that there is a need for a user-friendly interface design aimed at improving the effectiveness and efficiency of population demographic data management.

METHOD

In this study, the author used the Task-Centered System Design (TCSD) method to improve research precision. The results of the user interface design will then be evaluated using the System Usability Scale to see whether the design meets user needs. The steps implemented include the following stages [12]. The research framework is illustrated in the figure below.

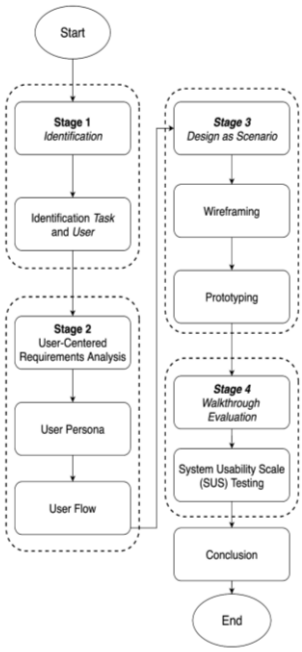

Figure 1. Research Framework

Identification

In the initial phase, system observation and interviews were conducted with staff members of the Muara Enim Disdukcapil office as potential system users. This interaction aimed to gather essential data and establish a preliminary understanding of the system, including its focal points and user tasks.

User-Centered Requirements Analysis

At this stage, the process of analyzing and identifying user personas and the needs of system users is carried out, as well as deciding which tasks are included or excluded in the design according to user needs based on interviews that have been conducted previously.

Design as Scenario

This stage aims to formulate the system design, define the process flow, and determine the types of data required by the system to be developed, while also creating a design that aligns with user needs and the tasks to be accomplished [13].

Walkthrough Evaluation

At this stage, a final evaluation of the designed system is conducted using the System Usability Scale (SUS), which consists of 10 simple questions to obtain an overall picture of subjective assessments of the system's usability [14]. The SUS uses a fivepoint Likert scale with weights ranging from 1 to 5 for each question.

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Table 1. SUS Questions

No	Questions Component
1	I think I would use this system regularly.
2	I find this system unnecessarily complex.
3	I think this system is easy to use.
4	I need technical assistance to use this system.
5	I find the functions in this system well integrated.
6	I think there is too much inconsistency in this system.
7	I believe most people would learn to use this system very quickly.
8	I find this system very cumbersome to use.
9	I feel confident using this system.
10	I need to learn a lot of things before I can get going with this system.

For odd-numbered questions, the scale position value is subtracted by 1, while for even-numbered questions, the scale position value is subtracted by 5. After that, the total score is multiplied by 2.5 to obtain the final SUS score [15].

RESULTS AND DISCUSSION

Identification

Based on the interviews previously conducted with employees of the Department of Population and Civil Registration (Disdukcapil) of Muara Enim Regency, it was found that the Demographic Information System aims to meet the needs of both staff and the public in accessing demographic data quickly and efficiently. The system provides features that enable users to view demographic data visualizations, search for demographic data, and download demographic data. Furthermore, the interview results also provided insights into user task identification, as presented in Table 2.

Table 2. Task User

No	Task	Description
1	Viewing Demographic Data	Access statistical data and visualizations without the need to log in.
2	Searching for Specific Data	Use the search and filter features.
3	Requesting data download	Fill out the download request form with personal information and the purpose of data usage.
4	Contact administration	Fill out the contact form or use social media channels.

User-Centered Requirements Analysis

At this stage, the researcher identifies the user persona, determines the user needs of the system, and defines which tasks will be included or excluded in the design based on the results of previously conducted interviews. The data collected from the interviews with potential system users revealed several expectations regarding how the system should function.

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Table 3. User Requirements Analysis

No	Task	Description
1	Viewing Demographic Data	The user accesses the public homepage, where the system immediately displays a summary of population statistics in the form of charts, interactive maps, and tables without requiring a login. Users can navigate through the menu to view data by district, gender, or age group.
2	Searching for Specific Data	The user utilizes the Search and Filter feature. The system provides a search bar and filter options. After selecting the desired criteria and clicking the Search button, the system displays the corresponding results in an interactive table or chart.
3	Requesting data download	To download the complete dataset, the user opens the Data Download Request Form. The user fills in their personal information and specifies the purpose of data usage. After clicking Submit, the system stores the request and awaits the admin validation process.
4	Contact administration	The user opens the Contact menu and fills out a form containing their name, email address, message, and question topic. After clicking Send, the system forwards the message to the admin's email/account and displays a confirmation that the message has been received. Alternatively, the system provides official links to the Disdukcapil's social media accounts or email, which can be accessed directly.

These expectations include website features that align with desired functionalities, minimize user confusion, and present information clearly. Table 3 illustrates the tasks included in the system based on the previously defined user requirements.

Design as Scenario

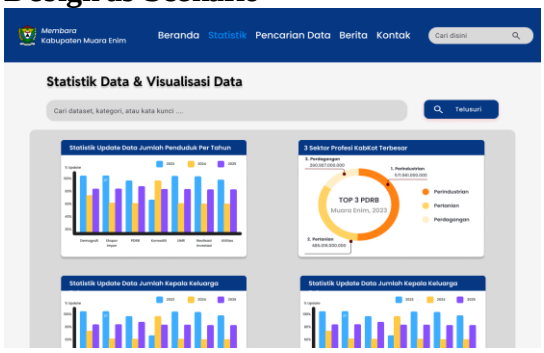

Figure 2. Statistics page

The Statistics page displays data statistics and visualizations of the datasets available in the system, allowing users to view them directly.

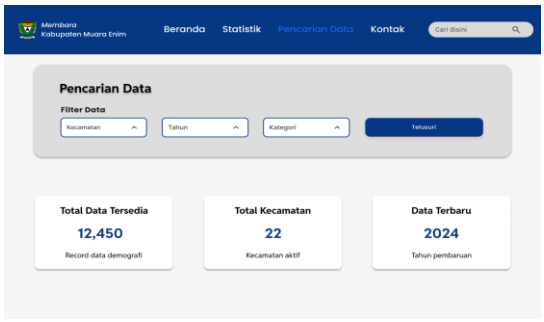

Figure 3. Data search page

This page provides a data search filter feature based on district, year, and category to help users easily find the desired data. The page displays information such as the total available data, total number of districts, and the latest data updates. On this page, users can click the Browse button to view the data they are looking for, which will appear according to the selected search filters. To download the data, users can click the Request Download button to submit a download request form.

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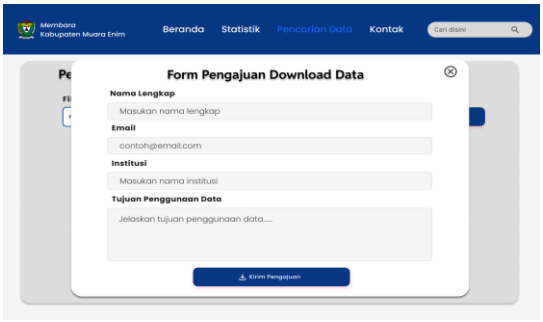

Figure 4. Download request form

This page is used by users to submit data download requests. The form contains fields for full name, email, institution, and purpose of data use. Once completed, users can submit their request by clicking the Submit Request button, after which the request will be processed.

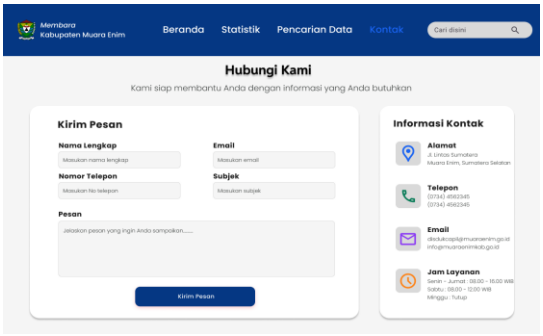

Figure 5. Contact page

On the Contact page, users can reach out to the administrators of the Muara Enim Regency Demographic Information System to submit questions, feedback, or requests for additional information. In addition, the page provides several details about the social media accounts of the Muara Enim Department of Population and Civil Registration (Disdukcapil).

Walkthrough Evaluation

At this stage, an evaluation of the system design is carried out using the System Usability Scale (SUS) method. Usability testing is conducted using the Maze website, by providing the prototype design that was created previously [16]. The testing process involved assigning a series of tasks for users to complete while interacting with the demographic information system. This evaluation was conducted online with 13 respondents.

Table 4. SUS Results

Respondent	SUS Score
R1	80
R2	77.5
R3	80
R4	82.5
R5	75
R6	80
R7	70
R8	80
R9	85
R10	82.5
R11	77.5
R12	75
R13	75
Final Score	78.5

Based on the results of the System Usability Scale (SUS) assessment conducted with 13 respondents, the final score yielded an average SUS value of 78.5. This score indicates that the design meets the “good” criteria according to the standard SUS rating scale.

CONCLUSION

The Task Centered System Design (TCSD) method has proven effective in mapping user requirements for designing the user interface of the Muara Enim Regency Demographic

Information System, with a focus on task-based design. The evaluation results using the System Usability Scale (SUS) yielded a score of 78.5, indicating that the proposed design is appropriate for user needs and falls into the "good" category according to the SUS standard. By emphasizing user tasks, the user interface design process becomes more focused on implementing features that align with user needs.

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