

Analysis and Design of User Interface and User Experience of Regional Tax Enterprise Resources Planning System with Design Thinking Method

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Received: 2022-06-30; Accepted: 2022-07-22; Published: 2022-07-29

Abstract— Regional Tax is one of the main sectors of independent income owned by each City or Regency to fund infrastructure development, education development, health services, and much more. The government agency that manages this regional tax is *Badan Pendapatan Daerah*, abbreviated as *Bapenda*. In particular, the West Bandung *Bapenda* has not implemented an online-based Regional Tax service system. This management system cannot be developed, and taxpayers have no independent account management. The appearance and user experience of the existing system has not matched the current design trends and the latest organizational structure. This greatly obstructs the services of *Bapenda* to taxpayers due to the lack of digital transparency. The system's flow is quite convoluted, thus affecting the quality and slow access to information. These limitations will be resolved through structured research using the Design Thinking and Usability Testing method for testing so that later it can be translated into an Enterprise Resources Planning system design with a good User Interface / User Experience. This method is structured following five phases: empathy, define, ideate, prototype, and test. The empathy phase aims to understand user problems, the define phase identifies and maps problems, the ideate phase aims to generate ideas, the prototype phase aims to implement the design based on the results of the previous steps, and the test phase aims to test the user. The final phase is the test phase and aims to test the user. The results obtained after applying this method follow user expectations.

Keywords— User Interface, User Experience, Design Thinking, Enterprise Resources Planning, Figma, Regional Tax.

I. INTRODUCTION

Badan Pendapatan Daerah (Bapenda) is one of the Regional Apparatus Work Units (*SKPD*) or agencies located in West Bandung Regency, which was established in 2021. Previously *Bapenda* was only a field under the auspices of *Badan Pengelolaan Keuangan Daerah (BPKD)*. According to the Regent's Regulation of 2021 concerning the duties, functions, and details of duties of the Regional Revenue Agency, the agency is tasked with the responsibility of assisting the regent in carrying out the supporting functions of Government Affairs in the financial sector, sub-national revenue management, or management of regional taxes and levies. These responsibilities fall under the region's authority and are the assistance tasks given to the region.

With the establishment of this Agency, *Bapenda* is required to accelerate innovation and service quality to taxpayers to the maximum during the rapid progress of industry 4.0. One way is to provide services that have been digitized so that access to information on tax filings and transactions can be accountable and transparent. To support this, *Bapenda*, especially the Development Analysis Sub-Sector, is working on updating the existing Enterprise Resources Planning (ERP) System. There are many shortcomings in the system. The current ERP system has technology that has not been updated; this system uses a Framework called Silverlight, which Microsoft has not developed since the end of 2021. There will be no further development of the *Bapenda* ERP system. The user experience is sufficient to make users uncomfortable

because the interaction between page switching, button interactions, and other interactions takes quite a bit. The interface's appearance is also quite lagging because it carries the Microsoft Windows 8 Operating System theme. This happened because of the lack of consideration and research in terms of design analysis.

According to [1], the researcher indicated that his study found that an agency that uses ERP systems reports fewer materials to Indonesia Corruption Watch (ICW) than an agency that does not use ERP systems. This was the conclusion drawn from the findings of the researcher's investigation. It supports the claim that ERP systems help improve internal controls over financial reporting as required by Sarbanes-Oxley Section 404. The researcher [2] discusses evaluating organizational climate factors in ERP systems. This study explains that the key variables that influence the use of tax ERPs are system quality, service quality, information quality, role clarity, teamwork & support, and training & learning. System quality, service quality, information quality, use, and training & learning were essential determinants in internal tax ERP system users' satisfaction [2]. However, based on the research [3], each life cycle phase must be carefully studied to change user and organizational behavior. For example, the use of the system will change substantially from an early to a later stage as users increase their skills, knowledge, and abilities. In addition, ERP researchers should focus on new emerging technologies and how they are implemented in conjunction with traditional ERP systems [3].

The author must design a User Interface (UI) and User Experience (UX) using a skilled method approach so that the ERP system built is even better than the ERP system that was researched previously to produce an ERP system with a comfortable experience and a modern interface that follows new emerging technologies. This will allow the author to produce an ERP system that provides a seamless experience and keeps up with new technological developments. The author analyzes and designs UI and UX using the Design Thinking method. The Design Thinking method is a human-centered or human-centric design approach to solving problems and presenting innovations [4]. This user-focused method was popularized by David Kelley and Tim Brown [5]; this method can focus on users because it has four elements, namely: People-Centered means based on users, Highly Creative means can use creativity freely, Hands-On means direct experiments, not only theory, and Iterative means a process that is carried out repeatedly to improvise.

During the development of *Bapenda's* new ERP system called SIPADA-PJDL (*Sistem Pajak Daerah - Pajak Daerah Lainnya*), the author focused on designing UI and UX using the Figma design application. The methodology used by the author in developing this system is the Design Thinking method. The author will explain how to apply this method at each step in detail so that this paper can also help researchers conduct research. The author believes that by applying the Design Thinking method to SIPADA-PJDL, it will be able to solve problems and present new innovations that can meet user needs.

II. LITERATURE REVIEW

1) Regional tax

Regional tax, in the future, referred to as a tax, is a mandatory contribution to the region which is owed by an individual or entity that is coercive based on statutory regulations, without receiving direct compensation and is used for the region for the greatest prosperity of the people of the region [6]. The Regional Taxes managed by this new system include Other Regional Taxes comprising hotels, restaurants, Parking, Entertainment, Non-Metal and Rock Minerals, Street Lighting, Groundwater, and Advertisements.

2) Enterprise Resource Planning (ERP) System

Conceptually, it can be said that the enterprise can be described as a group of people with certain goals who have the resources to achieve certain goals. Resources are resources in the form of company assets, such as financial assets, human resources, consumers, suppliers, orders, technology, and strategies. Resources can include all things that are the responsibility and challenges of management to be managed in order to generate profits for the organization as a whole [7].

So Enterprise Resource Planning (ERP) is a concept for planning and managing company or agency resources in the form of an integrated program application package with various modules designed to serve and support various

functions within the company so that its operations run in a structured and efficient manner.

3) User Interface (UI)

User interface (UI) is the process designers use to build interfaces in computerized software or devices, focusing on appearance or style. Designers aim to create an interface that users find easy to use and enjoyable. UI design refers to graphical user interfaces and other forms [8].

4) User Experience (UX)

User Experience (UX) is a term that encompasses a wide range of user experiences (emotions, attitudes, behaviors, and more) during interactions. The spread of smartphones and the introduction of Web services caused research in this field to be more active than ever [9].

User experience is not part of an interface's graphical display but the process passed by the user when interacting with the system. UX design with a user approach will provide comfort and convenience as long as the user interacts with the system. UX will be the link between business goals and user goals. Of course, UX design involving users will have a high success rate in delivering business and user goals [4].

5) Figma

Figma is a vector graphics editor and primarily web-based prototyping tool, with additional offline features enabled by desktop applications for macOS and Windows. The Figma mobile app for Android and iOS allows viewing and interacting with Figma prototypes on real-time mobile devices. The feature set of Figma focuses on use in user interface and user experience design, with an emphasis on real-time collaboration [10]. Figma is a platform design tool commonly used to design the interface of a system or application for various platforms such as web, mobile, desktop, and others. Generally, Figma is widely used by UI/UX Designers or someone who works in the design field because of its advantages over other design tool platforms.

6) Design Thinking

The design thinking method is an iterative process with several stages to identify and understand users, user problems, and solutions that allow the author to define the problem from a certain point of view. So that later the design thinking method will enable authors to generate as many ideas as possible and develop innovative solutions by democratizing the design through hypothesis testing and prototypes [11]. In other industries, procedures are similar to industry guidelines or standards; without them, there would be no clear guidelines to follow during design development [9].

This research is structured with the following five design thinking phases: empathy, define, ideate, prototype, and test. The following is an explanation of each stage :

1) *Empathy*: The empathy process determines the audience's characteristics for which the product is designed through detailed interviews and observations. This way, can find

detailed information about the product users and their needs [12]. At this stage, psychological knowledge will be beneficial, which can be achieved by involving users, such as by conducting interviews [11]. Data collection can be solved by following the design thinking process, especially in this first stage, which focuses on searching for and repairing the problem [9]. By knowing how each role carried out the work through user interviews and observation, then combining that information with points of problems obtained through the persona, authors could integrate how the problems encountered rise as personnel does his/her work with the established workflows [15].

2) *Define*: Define is a process to get views and understand user needs. An affinity diagram is used at this stage, and information architecture is made [14]. The solution method can develop after the problem definition process is carried out [4]. Ideally, this stage will define the problems that will focus on in the future development of UI/UX design prototypes [11].

3) *Ideate*: This phase should be completed by evaluating and selecting the best idea, then creating a prototype solution [12]. The ideas collected are then selected and prioritized based on the impact on users and system development [4]. These ideas will become high-fidelity mockups that will develop into prototypes [11].

4) *Prototype*: Prototype is the process of implementing the ideas that have been obtained [14]. The wireframing method is constructed using the software Figma, which is also used to transform the Wireframe into a shape with a higher degree of fidelity, known as a mockup, which is not clickable at the moment [15]. Following the mockup has been produced, interaction is added to it, after which it delivers a tangible product, and finally, it is put together in prototype form [11].

5) *Test*: Feedback from respondents is used to improve design solutions in prototypes that do not match user needs and problems [4]. From the experience of using a prototype, the input will be obtained to make the product better and make improvements to the current product [11]. Repeating the tasks and user analysis is considered a required action for some severe problems [13]. These tasks must be paralleled with what the users have described in the previous steps [13].

6) *Usability Testing*: The results of the usability testing from the prototype are categorized into three usability components: (1) efficiency, (2) effectiveness, and (3) the number of errors from using the system. The effectiveness is measured from the completion of each respondent's task on each given task. Standards are created before designing Usability Tests for measuring task completion. This standard is built according to the workflow of real-life users. The system's effectiveness is said to be low if the respondent cannot complete the task correctly. Efficiency is said to be poor if the time required to complete a task is large enough. Meanwhile, the number of errors is measured by respondents' flow errors when doing assignments [15].

III. RESEARCH METHODOLOGY

The author uses the Design Thinking methodology in the design process and utilizes the Usability Testing method at the testing stage. If the design process uses a structured methodology and follows the rules, it will produce quality research and can be accounted for from all aspects.

A. Design Thinking

This research is structured with the following five design thinking phases: empathy, define, ideate, prototype, and test. The following is an explanation of each stage:

1) *Empathy*: This stage aims to understand user needs, what motivates them, and what they do daily. The way we can empathize is to observe, engage users, and participate in understanding what they are feeling. The author conducted interviews and observations of system users involved in the scope of Bapenda. The results of interviews and observations that have been carried out are poured into an empathy map and user persona. These two methods are helpful as fundamental analyses of user needs and problems.

2) *Define*: The stages in this design thinking method aim to see the problem to be solved. From this stage, empathy is used to identify the issues and find potential that makes users better by defining problems based on user research results without losing the human side of the product. The author uses the Affinity Mapping Diagram technique in this process to define the problems. Through the affinity mapping diagram, the results of the previous process are classified into problems and needs. This is done so that the analysis of the problem is more organized.

3) *Ideate*: At this stage, the search for ideas will be carried out by paying attention to assumptions and creating innovative ideas. User needs will be identified at this stage through brainstorming to generate some ideas. A list of ideas that can be responded to will be generated through this stage. During brainstorming, the author collects as many ideas as possible based on the problems defined in the affinity mapping diagram. After all the ideas are collected, the author will rearrange them based on the priority of ideas that should need to become a solution.

4) *Prototype*: At this stage, the selected idea will be realized, where the chosen idea will be developed from a high-fidelity mockup to a prototype. This stage can be called the primary process of the design thinking method because the analysis results and ideas have been compiled, poured, and combined into a design product. This stage is divided into three processes, including (1) low-fidelity, (2) high-fidelity, and (3) prototype. The prototype is already user-testable, like the final product.

5) *Test*: The prototype that has been designed in the previous stage will be tested on the user. This stage has its method for testing; the author uses the Usability Testing method.

B. Usability Test

The author rigorously tests the complete product using the best solutions identified during the pre-defined phase. The results generated during the testing phase are used to redefine one or more problems and inform user understanding, conditions of use, and how people think, behave, feel, and empathize. During this phase, changes and improvements are made to eliminate problems arising during testing and gain the best possible understanding of the product and its users.

IV. RESULT AND DISCUSSION

This research was conducted in a structured and appropriate manner using Design Thinking and Usability Testing methods. The following is the result of the implementation of the method that the author has used:

A. Empathy

At this stage, an empathy map is generated from the interview and observation stages, which is helpful as the primary reference in identifying the problems experienced by users. By identifying the problem, the author can find the goal of the research itself and the problem formula. In this empathizing process, the author makes field observations and interviews with users and implements the creation of empathy maps and user personas.

At the interview stage, the writer compiled many questions before entering the observation. This interview was conducted as the beginning of data classification, which later became the material for analysis. At this stage, the author gets a lot of problems experienced by users. The following is a list of the main questions asked by the author:

- How many positions are there in this agency?
- What are the positions in this agency?
- Who are the users outside the office of the agency?
- What systems and applications exist in this agency?
- How far is the technology in the existing system?
- Are the operational standards of the current system in line with the regional and regent's regulations in this newly formed agency?
- What are the operational standards that should be carried out in the field of data collection?
- What operational standards should be carried out in the field of determination and service?
- What are the operational standards that should be carried out in the field of billing and control?
- What are the expectations of taxpayers regarding services that must be digitized?
- Does the user interface display on the current system meet user expectations?
- Are users satisfied with the experience of using the existing system?
- What are the problems faced when each position uses this system?
- Does it need a complete system overhaul in terms of interface and user experience?

Observations are carried out by monitoring all activities of officers in each position, from how they serve, process input to the current system, provide invoices, and user behavior in other parts when doing and using the current system. After getting the interviews conducted for one week, the authors conducted this observation for one month. The long time in this observation is because the authors identify the service process provided from *Bapenda* to taxpayers from beginning to end. The following are the results of the observations obtained :

- 1) *Field of data collection*: Starting from collecting data on new prospective taxpayers carried out by the data collection sector to determining NPWPD as a taxpayer.
- 2) *Field of determination and service*: The process of determining and validating various kinds of self-assessment and official-assessment tax claims is carried out by the field of determination and service to taxpayers.
- 3) *Field of billing and control*: The collection and inspection process carried out in the collection and control of the tax that has been determined, and there are indications of abnormal tax abnormalities.
- 4) *Structural Officers*: How do the heads of agencies, heads of divisions, and heads of sub-sectors verify, monitor, and evaluate the work of their sub-ordinates.
- 5) *Taxpayers*: Lastly, the process of taxpayers in submitting new taxpayer forms, tax reporting, tax payments, audits, checking file status, and other technical services.



Figure 1. Empathy Map

After completing the interview and observation, the authors compiled everything into an empathy map and user persona. The results of the empathy map that the author made can be seen in Figure 1.

The author uses a method called user persona to represent the target market; Personas must be created and determined by interviews and observations, where the author can categorize the results and patterns into several personas. This user persona is a character designed based on research to represent the types of users who use the product. Five user personas are generated, representing the level of roles in *Bapenda*. Here are some user persona views that have been created, shown in Figure 2.

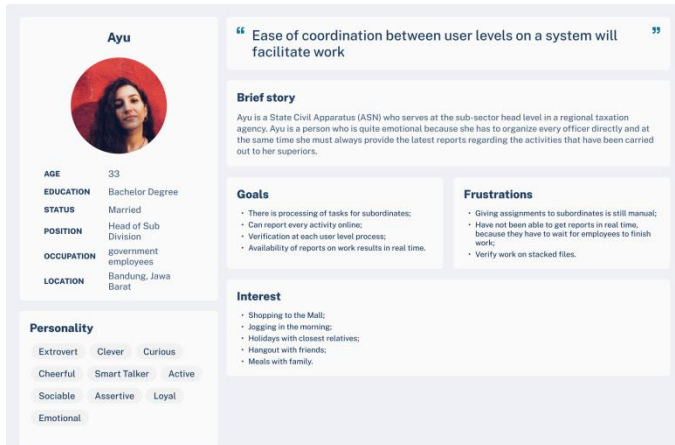


Figure 2. User Persona Head of Sub Division

From the results at this empathize stage, the author pours it into the following points:

- The interface design is not updated.
- Difficult to integrate with other systems.
- The current system has not adapted to the new organizational structure.
- The current system can only be accessed through previous versions of browsers that support the Silverlight framework.
- There is no stage of verification of submissions made by superiors.
- Limited admin features.
- The interface is not yet responsive for mobile-based devices.
- The activities of several positions have not been fully accommodated.
- There is no dashboard available to monitor the summary of the work that has been done.
- Taxpayers have not been able to apply for online services

B. Define

In the define stage, the results obtained in the interview process will be defined more clearly to focus on the core of the problem. The results of the empathize stage, which have been carried out for several users in each respective position,

are made into a collection of notes that are classified to each problem point and become an affinity mapping diagram. Notes are classified into nine sections, including the level of user access, user interfaces, transaction UX, verification UX, menu UX, taxpayer accounts, reports, major development, and information notification. Figure 3 shows the result of some affinity mapping diagrams.



Figure 3. Affinity Mapping Diagram

Furthermore, the affinity mapping diagram data that has been designed can be analyzed as the core of the problems, needs, and hypotheses in this study, from the results of the analysis that has been obtained, designed an information architecture that can help the author understand the system environment. Information architecture (IA) is the visual representation of infrastructure, features, and product hierarchies. IA can include navigation, application functionality and behavior, content, and flows. There is no set limit for the size or shape of the IA; however, it should cover the general structure of the product so that anyone (theoretically) can read it and understand how the product works. Figure 4 shows the resulting information architecture diagram based on the affinity mapping diagram that has been analyzed.

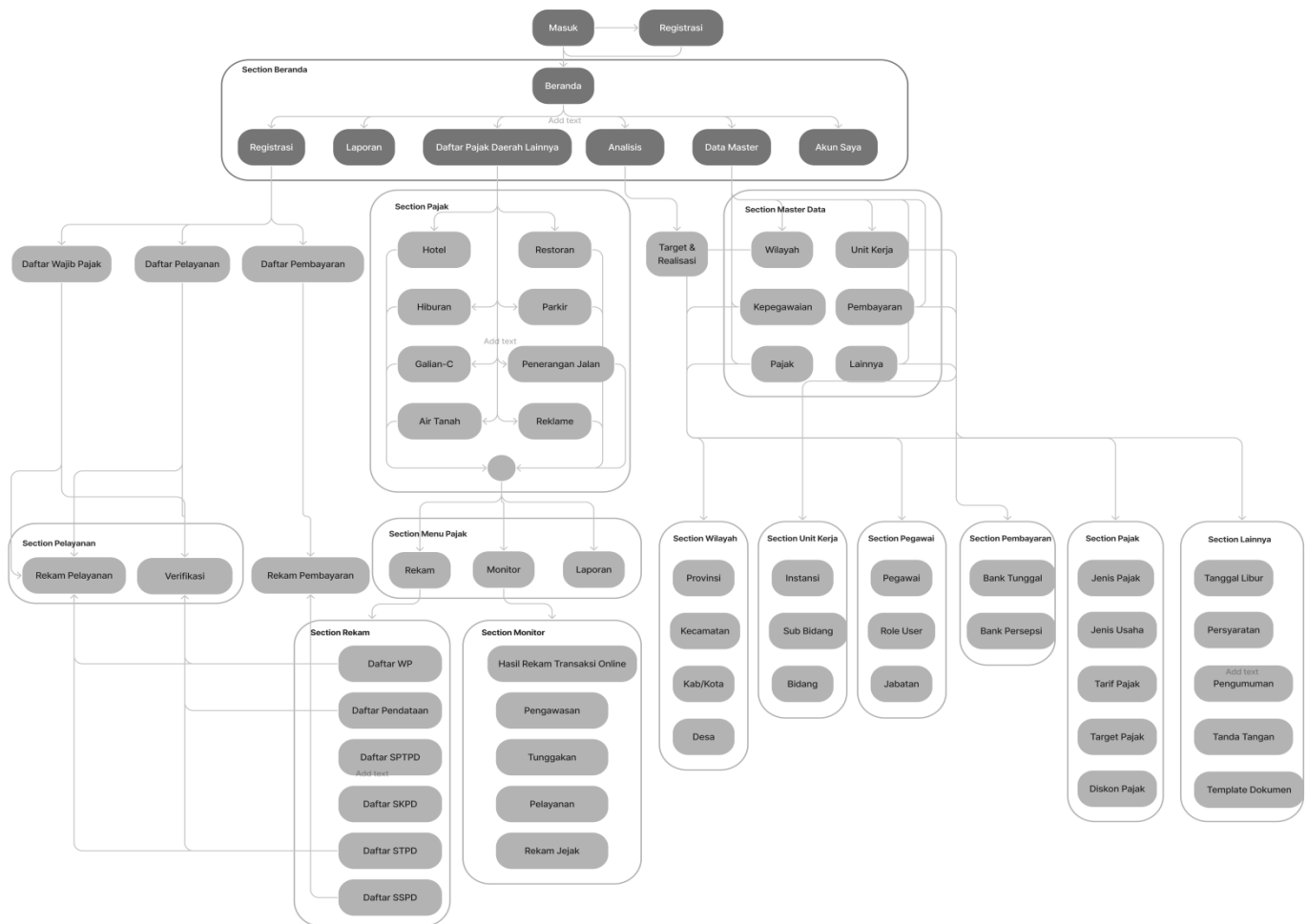


Figure 4. Information Architecture Diagram

C. Ideate

At this stage, collecting ideas through brainstorming is carried out, aiming to get solutions from solving existing problems. Ideas prioritization that can be seen in Table I is carried out as a form of finalizing the solution of the features that will be made into a design.

TABLE I
USER REQUIREMENT (ADDITIONAL FEATURES)

User Requirements (additional features)	Priority
Level of access rights for taxpayers, leaders, and field officers	High
UI design is made responsive and modern	High
Taxpayers can register for reporting, monitoring, and self-service	High
Regional reports, receipts, and information on Taxpayers' data	Low
Simplify system management UX for 8 other types of local taxes	High
Integration with other systems	Medium

User Requirements (additional features)	Priority
The menu of each field is adapted to the current organizational structure and rules	High
Installment management	Medium
Availability of submission verification at each disposition, so it can be paperless	High
Real-time notification on every user action	High
Tracking record of submission receipts	High
There is an inspection scheduling management menu	Medium

D. Prototype

The prototype is created in the form of a clickable mockup. However, before being used as a clickable mockup, the prototype is made in the form of a wireframe that puts aside visual aspects (such as colors, shadows, blur, etc.) and focuses more on managing the layout of elements and features. The final step is to modify the mockup so that it can interact with the user. The authors carry out the design implementation process using the Figma application from the ideate phase,

which has already produced a solution. The UI design has three stages of development, namely: (1) low-fidelity or Wireframe, (2) high-fidelity or mockup, and (3) Prototype.

The following is a demonstration of several menu sections on the Wireframe that the author has built; however, the author has chosen not to attach all of the results because there are simply too many.

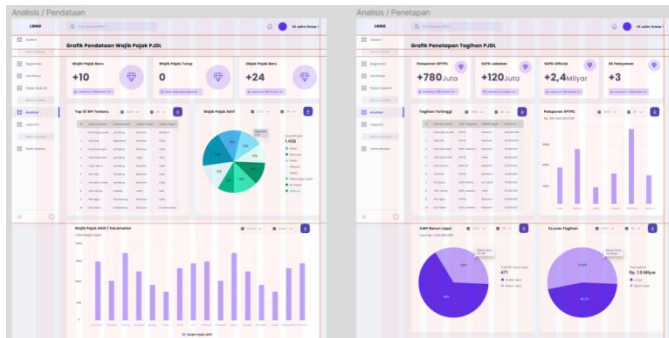


Figure 5. Local tax management wireframe

After the Wireframe or low-fidelity design process is designed and the results can be seen in Figure 5, the next stage is to create a mockup or high-fidelity design. But beforehand, at this stage, it is necessary to create a design style guide first to facilitate the high-fidelity design process; color schemes, typography, UI components, grid systems, and other components are contained in the design style guide. The following in Figure 6 is the *SIPADA-PJDL* design style guide and some of the high-fidelity design results.

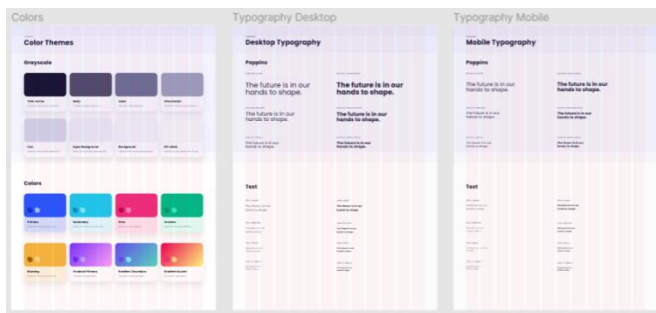


Figure 6. Design Style Guide

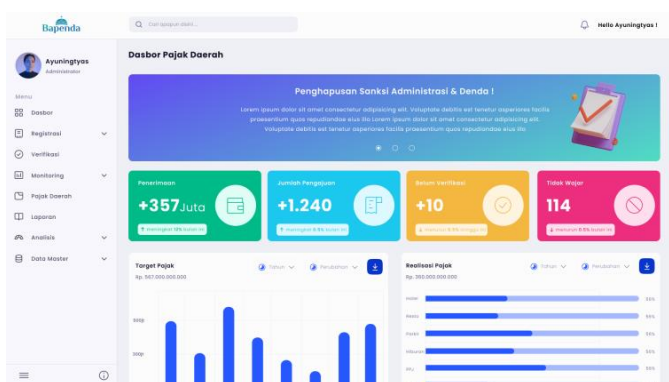


Figure 7. Dashboard Page

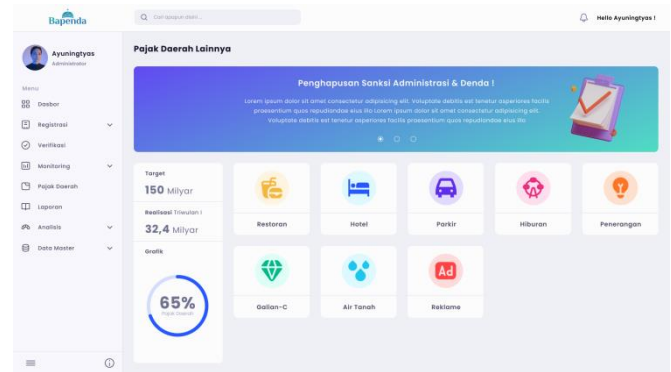


Figure 8. Other Local Tax Pages

Figure 9. Form page

Figures 7, 8, and 9 show the result of the mockup that the author has designed. The final stage, after the Wireframe and high-fidelity design stages are completed, is to design a prototype so that the users can test and interact directly before proceeding to the last phase.

E. Test

This stage helps to get users to feedback after the design realization that has been designed during this design thinking process. Testing is carried out using the Usability Testing method through access to sharing prototypes from the Figma application. The test will reveal several issues with the design. The results should be adequately checked to understand each problem's severity and whether the planned adjustment will solve them. Then, the interface should be revised and tested.

According to the user-persona at the empathize stage, this test involves 20 respondents of 15 positions in the Bapenda agency and taxpayers. Each position has a different scenario, and the goal is to get the most effective and valid results. The problems that have been mapped in the defined process are used as the main points in testing this system.

TABLE II
TESTING SCENARIOS

Scenario	Goal
Users perform dashboard analysis	Users can understand and get solutions from the dashboard analysis results that are displayed
User registers a new	Users can find the taxpayer registration

Scenario	Goal
Taxpayer menu and register data until it is complete	
Users make SPTPD reporting	Users can find the SPTPD reporting menu and register
User registers Tax Installments	Users can find the tax installment menu and register data
User performs SSPD validation	Users can find the SSPD list menu and perform data validation to completion.
User registers service	Users can find the service menu and register data to completion.
Users search for a specific tax type menu	Users can find the menu of the tax type they are looking for and select the required menu management.
Users print and download the required reports	Users can search, print and download the required reports.
User looking for submission	Users can find a list of submissions that are being processed
Users do tracking submissions	Users can find the track submission menu and perform tracking from the receipt column that has been inputted.
Users verify submissions	Users can find the verification menu and verify as well as return submissions;
User performs inspection scheduling	Users can find an audit scheduling menu and schedule a tax payer.

After preparing the test scenarios with high priority indicators in Table II, testing by the respondents from each scenario has been arranged. In the Table that will be presented, there is a green circle which indicates the success of the process and a red circle that indicates the failure of the process.

1) *Dashboard Analysis Scenario*: This test was carried out by 8 respondents from the structural position of the sub-sector head and the head of the field. Based on the results of the tests carried out in Table III below, in the first indicator, 4 respondents failed to carry out the analysis because it was caused by a lack of information on the comparison percentage listed on the card. For the other 2 indicators, respondents managed to analyze everything correctly. It was decided on the first indicator. A design revision was made on the information card so that users get a clear understanding.

TABLE III DASHBOARD ANALYSIS SCENARIOS			
Examiner	Analyzing Tax Data Card	Analyze Bar Graphs	Analyze Circle Graph
1	●	●	●
2	●	●	●
3	●	●	●
4	●	●	●
5	●	●	●
6	●	●	●
7	●	●	●
8	●	●	●

● Indicates the success of the process
● Indicates the failure of the process

2) Taxpayer Registration Scenario

Three respondents carried out this test service officers and taxpayers. According to the findings of the experiments that were carried out and presented in Table IV below, in the second indicator, there is only one respondent who was unable to carry out the scenario because it was caused by a misunderstanding in the filling out of the form in the information section of the owner and place of business, whose fields tend to be repeated and almost exactly the same. Because of the addition of the feature for detecting duplicate data, it was agreed that nothing should be changed.

TABLE IV
THE SCENARIO OF TAXPAYER REGISTRATION

Examiner	Selecting The Taxpayer Registration Menu	Doing Taxpayer Registration
1	●	●
2	●	●
3	●	●

● Indicates the success of the process
● Indicates the failure of the process

3) *SPTPD Reporting Scenario*: This examination was carried out by three service officials and respondents from the taxpayers. According to the findings of the experiments that were carried out and presented in Table V below, two of the respondents were unable to carry out the scenario in the third indicator because it was caused by the display of detailed data information lists that had too many columns, making it quite time-consuming to analyze. It was determined that the modal data design, which had previously been presented in the form of a Table of details, would be reworked to take the shape of a card list.

TABLE V
SPTPD REPORTING SCENARIOS

Examiner	Selecting The SPTPD Reporting Menu	Registering SPTPD	Checking Data Integration
1	●	●	●
2	●	●	●
3	●	●	●

● Indicates the success of the process
● Indicates the failure of the process

4) *Installment Registration Scenario*: This test was carried out by 2 respondents from the service officer position and the head of the sub-sector. Based on the results of the tests that have been carried out in Table VI below, all the indicators have successfully carried out the scenario, so there is no need for design changes.

TABLE VI
INSTALLMENT REGISTRATION SCENARIOS

Examiner	Choose The Tax Installment Menu	Register Installments	Understanding Installment Information
1	●	●	●
2	●	●	●
●	Indicates the success of the process		
●	Indicates the failure of the process		

5) *Validating SSPD Scenario*: This test was carried out by 2 respondents from the position of the validation officer. Based on the results of the tests in Table VII below, all the indicators have successfully carried out the scenario, so there is no need for design changes.

TABLE VII
INSTALLMENT REGISTRATION SCENARIOS

Examiner	Selecting The SSPD List Menu	Perform SSPD Validation
1	●	●
2	●	●
●	Indicates the success of the process	
●	Indicates the failure of the process	

6) *Service Registration Scenario*: This test was carried out by 2 service officers and taxpayers' respondents. Based on the results of the tests in Table VIII below, all the indicators have successfully carried out the scenario, so there is no need for design changes.

TABLE VIII
INSTALLMENT REGISTRATION SCENARIOS

Examiner	Choose The Service Registration Menu	Registering Services
1	●	●
2	●	●
●	Indicates the success of the process	
●	Indicates the failure of the process	

7) *Searching for Specific Tax Type Menu Scenario*: This test was conducted by 15 respondents from all positions. Based on the results of the tests in Table IX below, most of the indicators have successfully carried out the scenario, so there is no need for design changes.

TABLE IX
SCENARIOS LOOKING FOR A SPECIFIC MENU FOR TAX TYPES

Examiner	Looking For The Tax Type Menu	Looking For A Specific Tax Management Menu
1	●	●
2	●	●

Examiner	Looking For The Tax Type Menu	Looking For A Specific Tax Management Menu
3	●	●
4	●	●
5	●	●
6	●	●
7	●	●
8	●	●
9	●	●
10	●	●
11	●	●
12	●	●
13	●	●
14	●	●
15	●	●

● Indicates the success of the process
● Indicates the failure of the process

8) *Printing and Downloading Reports Scenario*: Five respondents carried out this test from the structural position of the head of the sub-sector. Based on the results of the tests in Table X below, all the indicators have successfully carried out the scenario, so there is no need for design changes.

TABLE X
SCENARIOS PRINTING AND DOWNLOADING REPORTS

Examiner	Looking at The Report Menu	Download Report	Print Report
1	●	●	●
2	●	●	●
3	●	●	●
4	●	●	●
5	●	●	●

● Indicates the success of the process
● Indicates the failure of the process

9) *Seeking Submission Scenario*: Two respondents carried out this test service officers and taxpayers. The results of the tests that were performed are summarized in Table XI below. The third indicator demonstrates that the scenario has failed because the information that is listed on the card list is insufficient. As a result, the display needs to be modified so that the summary information that is presented on the card list can be fully comprehended.

TABLE XI
SCENARIOS OF SEEKING SUBMISSIONS

Examiner	Looking For Submission Menu	Understand Submission Details	Understanding The Information On The Card List
1	●	●	●
2	●	●	●

Examiner	Looking For Submission Menu	Understand Submission Details	Understanding The Information On The Card List
1	●	●	●
2	●	●	●

● Indicates the success of the process
● Indicates the failure of the process

10) *Tracking Submission Scenarios*: This test was carried out by 2 service officers and taxpayers' respondents. Based on the tests in Table XII below, all indicators were successful for the scenario, so there was no need for design changes.

TABLE XII TRACK SUBMISSION SCENARIOS		
Examiner	Looking For The Track Submission Menu	Making Tracking Applications From Receipts
1	●	●
2	●	●

● Indicates the success of the process
● Indicates the failure of the process

11) *Submission Verification Scenario*: 4 respondents carried out this test from the structural position of the head of the sub-sector. Based on the results of the tests carried out in Table XIII below, there are 3 failure scenarios in the third indicator due to the unavailability of the field for notes if the submission is returned. A design change is required by adding a note field.

TABLE XIII SUBMISSION VERIFICATION SCENARIOS			
Examiner	Looking For a Verification Menu	Doing Verification	Returning Submissions
1	●	●	●
2	●	●	●
3	●	●	●
4	●	●	●

● Indicates the success of the process
● Indicates the failure of the process

12) *Examination Scheduling Scenario*: Three respondents carried out this test from the structural position of the head of the sub-sector. Based on the results of the tests carried out in Table XIV below, there is a scenario test failure in the second indicator because the scheduling menu is integrated with the verification card list, so it is difficult for users to find the menu. But this is considered ideal because this scheduling menu must be integrated with the verification menu to determine the schedule according to the selected verification list.

TABLE XIV
EXAMINATION SCHEDULING SCENARIOS

Examiner	Searching The Scheduling List	Doing Scheduling
1	●	●
2	●	●
3	●	●

● Indicates the success of the process
● Indicates the failure of the process

V. CONCLUSION

The analysis and design of the User Interface and User Experience on the Regional Tax ERP system that has been carried out using the design thinking method has succeeded in realizing user needs at the agency of West Bandung *Bapenda*. Users from fourteen positions at *Bapenda* and users from two sample taxpayers were very cooperative in fully explaining the problems they faced previously. The results they obtained were satisfactory and in line with user expectations. This implementation is completed in a structured manner, and an iterative process can be carried out if, in the testing process, there are design changes as needed. Several main points can be concluded based on the final results achieved on the prototype that has been designed and revised. First, the design thinking method is proven to overcome user problems and needs for the system to be designed in an organized manner because the achieved final results are built through proper and well-documented data analysis. Second, the usability testing method is one way to determine whether the user can easily use the application, how efficiently and effectively an application can help the user achieve its goals and whether the user is satisfied with the system used.

In the future stages of designing the *SIPADA-PJDL* system, later, the author will make improvements in an appearance on several types of platforms and other devices so that they are responsive. The author will also use different testing methods such as User Acceptance Test (UAT), System Usability Scale (SUS), or other methods to make testing more systematic. Due to time constraints in designing this UI/UX, the author only does the design on a PC or laptop-based device first.

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