

Operational Data Integration with Pureshare Dashboard for Unified Service Unit

Hana Silvanov Rhamadani¹, Pradita Eko Prasetyo Utomo^{2*}, Mutia Fadhila Putri³

^{1,2,3}Universitas Jambi, Indonesia

¹angkasasilvanovr@gmail.com, ²pradita.eko@unja.ac.id, ³Mutia.fadhila@unja.ac.id



*Corresponding Author

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ABSTRACT

Public institutions in digital era increasingly require integrated data to support decision-making and performance monitoring. The development of the Electronic Unified Service Unit (ULT-E) at the Jambi Language Office responds to this need by establishing a mechanism capable of consolidating operational data. The objective of this research is to design and develop a service dashboard using Pureshare as a guiding framework for identifying requirements, planning visual structures, and organizing information elements. The key performance indicators are presented as operational indicators across operational service data, including service requests, complaints, and public satisfaction. The development process includes requirement user, operational indicators, visual design, data integration through ETL procedures. The results show that the dashboards produced in this research present key performance indicators as operational indicators across three main areas, service requests, complaints, and public satisfaction surveys. The visual components consist of drill-down and time-range features for data exploration. The integration of these dashboards into the operational web interface indicates that the system is ready to support the institution's digital service environment. The average System Usability Scale (SUS) score of 72.50 represents that users were able to follow the interaction flow and understand the visual components provided. The conclusion is that dashboard development can enhance service management efficiency, even when data conditions differ across modules, making operational information more accessible.

INTRODUCTION

The advancement of information technology encourages public institutions to enhance service governance practices through the utilization of digital systems that furnish data rapidly, accurately, and consistently as the foundation for more effective decision-making (Latifah et al., 2023). Dashboards serve an essential role as a strategic solution in this process because they can transform raw data into visual information that is easily understood by decision-makers and service implementers (Matheus et al., 2020). Dashboards function as business-intelligence-based visualization tools integrated with multiple data sources, thereby contributing to improved service efficiency (Nurhakim & Voutama, 2025). The absence of data visualization may restrict ideas in presenting service information in a visual format (Setiadi et al., 2025).

The Jambi Language Office is currently developing an Electronic Unified Service Unit (ULT-E) to enhance service effectiveness. However, challenges arise in integrating legacy service data that remain stored in Spreadsheets. Consequently, this condition generates obstacles in data consolidation, preventing the execution of analysis within an integrated system because the data are not connected within a unified platform. This situation creates an urgent need to establish a mechanism that consolidates all service data into a single integrated system that can be accessed and analyzed more comprehensively.

This research aims to develop a service dashboard by integrating all historical data into the ULT-E through extraction, transformation, and loading (ETL). The ETL process is used to harmonize the structure of legacy data originating from various Spreadsheets so that all information can be processed consistently within a centralized ULT-E database. To support this process, the research implements the Pureshare framework as a development methodology, encompassing the formulation of requirements, the review of service workflows, prototype construction, iterative evaluation, and the refinement of functionalities prior to release (Lestari & Rohmani, 2018). This framework ensures that the resulting dashboard aligns with the institution's operational processes and is capable of presenting service metrics in a concise, interactive, and easily monitored visual format for decision-makers. In addition, this methodological alignment enhances the reliability of performance monitoring by establishing a coherent linkage between legacy data structures and contemporary operational demands.

Previous studies indicate that dashboards have been effectively utilized in various contexts to enhance monitoring speed. A maternal-care service dashboard was able to display forty-three key indicators and present immunization coverage, pregnancy services, and childbirth services more comprehensively, thereby improving the



effectiveness of evaluation processes (Anisyah et al., 2025). Another research shows that dashboards developed using the Pureshare framework have also proven beneficial, such as in monitoring warehouse operational costs through Cost Per Case, which can present cost burdens per activity with precision and support daily cost analysis (Anggraeni & Amarilies, 2022). These findings demonstrate that dashboards provide significant contributions in delivering structured information for various organizations. Building on these achievements, this research implements ETL processes and the Pureshare framework to consolidate the historical service data of the Unified Service Unit and develop a service dashboard specifically designed for the needs of the Jambi Provincial Language Office.

LITERATURE REVIEW

Digital requirements in public services drive government institutions to adopt more integrated data-management systems. Dashboards present key information in a structured way so that users can monitor conditions quickly (Dwi Bima Sakti et al., 2024). Dashboards summarize metrics through charts and tables, making information easy to interpret. Dashboards also provide interactive data displays to support real-time monitoring based on categories or periods (Purwanto et al., 2023).

Dashboard development requires tools that support visual presentation of information based on organizational performance measurement. Pureshare becomes one of the methods used to build dashboards because it focuses on presenting Key Performance Indicators in a visual format that is easy to analyze (Yunus et al., 2020). This method helps organizations monitor performance comprehensively through metric statements directly linked to service processes (Irsan et al., 2019). Pureshare combines top-down and bottom-up approaches so that dashboard construction not only presents visual results but also considers data structures and ongoing performance-evaluation processes (Dewi & Muazim, 2022). This concept shows that dashboards function as information-delivery tools that support direct performance monitoring.

The dashboard-development method through Pureshare has structured stages that ensure alignment between user needs and available data (Dewi & Muazim, 2022). The planning and design stage uses a top-down approach to determine user needs and establish Key Result Areas as the basis for defining KPIs (Leo et al., 2022). The system and data review stage applies a bottom-up approach by identifying data sources, access mechanisms, and data quality. The prototype-implementation stage integrates both approaches to produce an initial display that can be evaluated promptly. The prototype-refinement stage involves users in testing dashboard functions. The release stage ensures the dashboard can operate in its intended environment. The continuous-improvement stage supports dashboard adjustments to organizational changes (Lestari & Rohmani, 2018). These stages show that dashboard development requires a systematic process.

Previous research by (Fildzalia & Nurfikri, 2024) shows that the use of quality and patient safety control dashboards services can enhance the speed of information access and help organizations understand service conditions in a measurable way. Dashboard research in warehouse operations has proven capable of producing more effective cost analysis and enabling real-time monitoring of warehouse performance, as well as helping identify improvement areas to increase productivity and cost efficiency (Anggraeni & Amarilies, 2022). This literature review emphasizes that dashboard development requires a structured method and well-processed data. This research focuses on dashboard development using the Pureshare method and the integration of legacy data through extract, transform, and load processes so that the information presented aligns with user needs. This approach ensures that collected data can be displayed in visual formats that support consistent monitoring of service performance.

METHOD

This research uses the Pureshare development methodology modified into a preparation phase, a dashboard-development stage, and a final stage review phase. The procedural framework this research is outlined as follows:

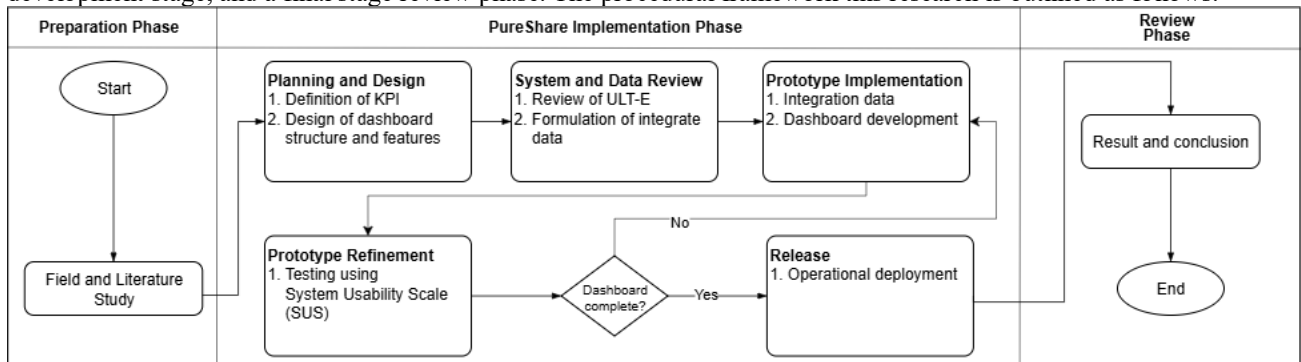


Fig. 1 Research Flow

Field and Literature Study

This stage involves comprehensive observation of the legacy service workflow and the updated ULT-E process. Subsequently, problem identification is conducted on the structural characteristics of both datasets, including data formats, attributes, and prospective integration patterns. Literature concerning data integration, statistical visualization, and the Pureshare framework is utilized to formulate the preliminary design of the solution. This stage produces a consolidated list of user requirements, a mapping of the old and new data structures, and an initial conceptualization of the dashboard.

Planning and Design

This stage contains the systematic identification of user requirements and the formulation of Key Performance Indicators (KPI), alongside the delineation of functional specifications to be represented within the dashboard. Through the application of a rigorous top-down design approach, this stage establishes the principal foundation for determining the relevance, analytical coherence, and structural layout of the dashboard interface, ensuring that each visual component aligns with organizational performance imperatives.

System and Data Review

This stage is executed concurrently with the planning and design stage, emphasizing a bottom-up implementation strategy as an analytical mechanism. The approach involves a comprehensive examination of discrepancies between spreadsheet-based legacy data models and the ULT-E database schema. The quality of historical datasets is scrutinized with respect to attribute integrity, data formatting consistency, and duplication. Subsequent adjustments are carried out to harmonize these structures with the ULT-E data framework. The ETL workflow is meticulously designed to manage spreadsheet extraction, normalize heterogeneous column structures, and remap attributes to the revised schema (Aisyah et al., 2023). Data extraction procedures are conducted through authorized Google service accounts to guarantee a controlled and traceable acquisition pipeline.

Prototype Implementation

This stage materializes the design into an operational dashboard prototype. The ETL process is executed to generate an integrated dataset derived from legacy sources and the new ULT-E data model. The prototype is developed using JavaScript, presenting KPIs, interactive visual analytics, supporting tables, and printable dashboard summaries. All visual components are programmatically linked to the integrated dataset to ensure that data representation corresponds precisely to user requirements and pre-established indicators.

Refinement

This stage encompasses the enhancement of graphical representations and the implementation of final revisions based on prototype testing using System Usability Scale (SUS) (Susila & Arsa, 2023). Each refinement is systematically documented and applied to elevate dashboard quality and analytical fidelity.

Release

This stage includes deploying the dashboard into the operational environment and preparing comprehensive documentation of the research outcomes.

RESULT

The application of the research framework within the Method section is elaborated in this part, encompassing the preparation phase through the final review of the dashboard output, which is detailed according to the Pureshare framework as follows:

Planning and Design

In this phase, the development of the ULT-E dashboard employs a top-down design approach. The objective of this process is to ensure that the dashboard aligns with user requirements and organizational goals. The principal outcomes of the user-needs assessment are presented as follows (Bahtiar et al., 2025):

1. Identification of Dashboard Objectives

The primary objective of the dashboard development is to provide a platform capable of integrating previous service data so that the dataset becomes standardized in accordance with the new system, with an emphasis on visually representing metrics to support performance monitoring at the The Jambi Language Office within the ULT. The dashboard in this research serves as an additional feature and an innovation within the ULT-E development, facilitating reporting and service monitoring.

2. Identification of Dashboard Users

The target users of the dashboard are the reporting officers of ULT. These officers utilize the dashboard to monitor metrics across different services, streamline reporting processes, observe daily service trends, and



- support strategic decision-making.
3. Identification of Dashboard Type
 Based on the identified objectives and users, the dashboard developed in this research is classified as an operational dashboard that delivers real-time benefits for daily and quarterly operational monitoring.
 4. Determination of KPI in the Dashboard
 The determination of KPI is based on a combination of user interviews and a review of institutional performance targets. Specifically, the KPI are derived from the reference of SK 7 The Jambi Language Office with the target of improving the governance of the Jambi Language Office (Balai Bahasa Provinsi Jambi, 2024). In addition, the results of the interviews with ULT officers formulated Operational Indicators derived from the KPI, based on services menu and measured through satisfaction surveys, providing a general overview of service performance as presented in the following table.

Table 1. Operational Indicators

No	KRA	Operational Indicators	Description
1		Number of Completed Requests	Indicates the total number of service requests that have been completed.
2		Number of Requests in Process	Describes the number of service requests that are still under handling.
3		Number of Rejected Requests	Presents the number of service requests that cannot be processed or do not meet requirements.
4		Total Incoming Requests	Displays the overall number of requests received.
5		Total Respondents	Indicates the number of respondents in the satisfaction survey.
6		Most Requested Service	Displays the service category with the highest number of requests.
7		Daily Request Trends	A line chart illustrating day-to-day variations in the number of requests.
8	Service Requests	Request Distribution per Category	A bar chart showing the distribution of requests across service categories.
9		Top Five Services	A bar chart presenting the five service categories with the highest number of requests.
10		Applicant Education Level	A bar chart showing the distribution of applicants by education level.
11		Applicant Occupation	A bar chart illustrating the distribution of applicants based on occupational type.
12		Request Status	A donut chart showing the proportion of requests by processing status (completed, in process, rejected).
13		Gender Distribution	A donut chart displaying the composition of applicants by gender.
14		Service Category Drill-Down	An exploration feature enabling deeper inspection of requests within specific categories.
15		Total Complaints	Indicates the total number of complaints.
16		Completed Complaints	Displays the number of complaints that have been resolved.
17		Complaints in Process	Describes the number of complaints currently being handled.
18	Complaints	Rejected / Invalid Complaints	A KPI prepared to display complaints that do not meet validity requirements.
19		Complaint Status	A donut chart showing the proportion of complaint handling statuses.
20		Complaint Trends	A line chart illustrating day-to-day changes in the number of complaints.
21		Total SKM Respondents	Presents the number of respondents participating in the public satisfaction survey.
22		Public Satisfaction Index (IKM)	The index score resulting from satisfaction measurement based on service elements.
23	Public Satisfaction Survey	Service Quality	Conversion of the IKM score into a service quality category.
24		Average Score per Element	Indicates the average value of each service element/aspect.
25		Category Distribution of Element Scores	A bar or donut chart showing proportional differences across service element scores.
26		Recommendation Level	Displays the readiness level of respondents to recommend the service.

27	SKM Recapitulation per Element	A detailed table containing final scores for each element in IKM format.
28	Service Category Drill-Down	An exploration feature to view detailed request information within specific categories.

5. Identification of Dashboard Design Requirements

Based on the determined Operational Indicators, the dashboard design requirements include key information for each metric, types of visualization such as Operational Indicators cards, bar charts, line charts, and pie charts, as well as detailed presentations supplemented with drill-down features for more granular exploration. A time-range feature is included to support monitoring across specific periods according to analytical needs, and a printout feature is added to provide a concise report format that users can generate.

6. Development of the Dashboard Layout Design

The interface design process is constructed based on the requirements identified in the previous steps. The layout is structured according to the services menu, namely service submissions, complaints, and satisfaction surveys.

System and Data Review

In this phase, the development process is conducted through a bottom-up implementation approach to examine the data sources that form the foundation of dashboard construction by tracing the structure and content of the existing database operating within the ULT-E system. Additionally, this phase includes the design of the ETL process as a subsequent procedure following the system and data assessment. Data collection for this stage is conducted through discussions with relevant staff, as detailed in the table below:

Table 2. History Dataset

No	Data Name	Data Column	Description
1	Service request data	nama_lengkap; instansi_lembaga_komunitas; posel; nomor_posel; jenis_layanan; deskripsi_permohonan; file_surat_permohonan; berkas_permohonan	Data on official service requests submitted by the public to government institutions.
2	Public satisfaction survey data	nama_petugas; nama_pengguna_layanan; jenis_kelamin; posel; instansi; jenis_layanan; syarat_pengurusan_pelayanan; sistem_mekanisme_prosedur_pelayanan; waktu_penyelesaian; kesesuaian_biaya; kesesuaian_pelayanan; kemampuan_petugas; petugas_perilaku; penanganan_aduan_layanan; sarana_prasarana; pungutan_liar; promotor_layanan; kritik_saran	Data for evaluating services and assessing user perceptions regarding the quality of services received.
3	Complaints data	nama_lengkap; nomor_posel; posel; pekerjaan; instansi; isi_aduan; file_aduan	Data on complaints concerning obstacles encountered in the process of service delivery.

Prototype Implementation

This phase transforms the dashboard layout design into an operational prototype. Implementation is carried out by first integrating the datasets and subsequently developing each section of the dashboard as follows:

1. Data Integration

Figure 2 illustrates the execution of the data-extraction process from legacy sources into the new ULT-E database. The process begins with verifying whether data from the Google Sheets have been previously processed to prevent duplicate extraction from the same source. The extraction stage utilizes the Google Client API, with the variable \$rows functioning to retrieve all data from the spreadsheet.



```
1 $spreadsheetId = '1GVUBMkQV1R7ZysIWAT2ZHgrJzqGdMPn8kbGEAaFrbpk';
2 $exists = DB::table('etl_log')
3     ->where('spreadsheet_id', $spreadsheetId)
4     ->exists();
5
6 if ($exists) {return 'Silakan gunakan data yang lain karena data ini telah dilakukan proses ETL';}
7 $sheetName = 'Form Responses 1';
8
9 $client = new \Google\Client();
10 $client->setAuthConfig(storage_path('app/google/credentials.json'));
11 $client->addScope(\Google\Service\Sheets::SPREADSHEETS_READONLY);
12
13 $service = new \Google\Service\Sheets($client);
14 $rows = $service->spreadsheets_values->get($spreadsheetId, $sheetName)->getValues();
15
16 if (empty($rows) || count($rows) < 2) {return "Tidak ada data.";}
17 unset($rows[0]);
18 foreach ($rows as $row) {$row = array_pad($row, 9, null);}
```

Fig. 2 Extract Data

2. Dashboard Interface for Service Requests

The prototype of the service-request statistical dashboard in Figure 3 presents visualized data in the form of KPI cards, line charts, bar charts, and donut charts that update according to the selected date range. The KPI cards display key information such as the total number of requests, completion status, total respondents, and the most frequently accessed service categories. Daily request trends are visualized through a line chart, while bar charts depict the top five services, the distribution of requests by category, and applicant characteristics based on education and occupation. The category chart is equipped with a drill-down feature for more specific data exploration, as shown in Figure 4. The donut chart represents the proportion of request statuses and gender distribution, ensuring that all visual elements of the dashboard reflect ETL outputs in a structured and analytically coherent format. A printout feature is also provided as a medium for generating concise summary reports.

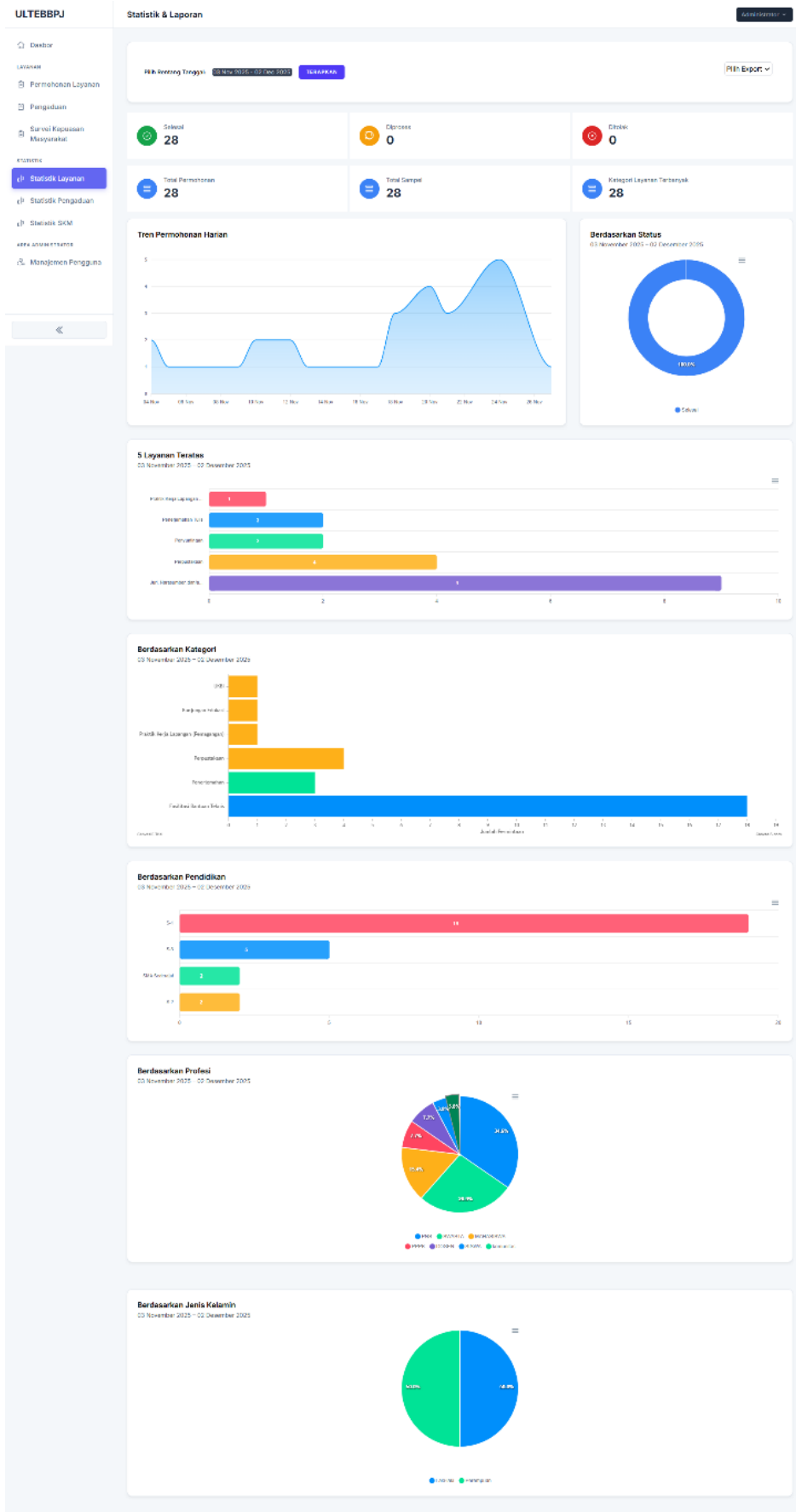


Fig. 3 Dashboard of Service Request



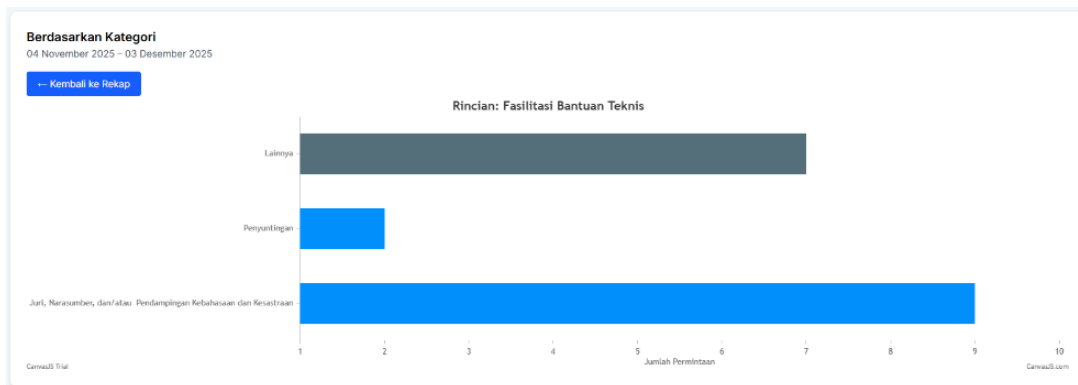


Fig. 4 Prototype Drilldown Service Category

3. Dashboard Interface for Complaints

The complaints dashboard prototype is developed without an ETL process because complaint data were unavailable during the research period. Therefore, the dashboard construction focuses on layout design, placement of visual components, and presentation of KPI derived from the structure of the new database. The prototype displays key indicators such as total complaints and details of their resolution status. In addition to KPI cards, the prototype includes a layout for daily complaint trends, donut charts, and pie charts categorized by occupation, designed to illustrate complaint distribution and handling proportions. The prototype indicates that the interface and visual-presentation mechanisms are ready for use and can instantly display complaint data once data entry begins. A printout feature is also available to generate concise reports for users.

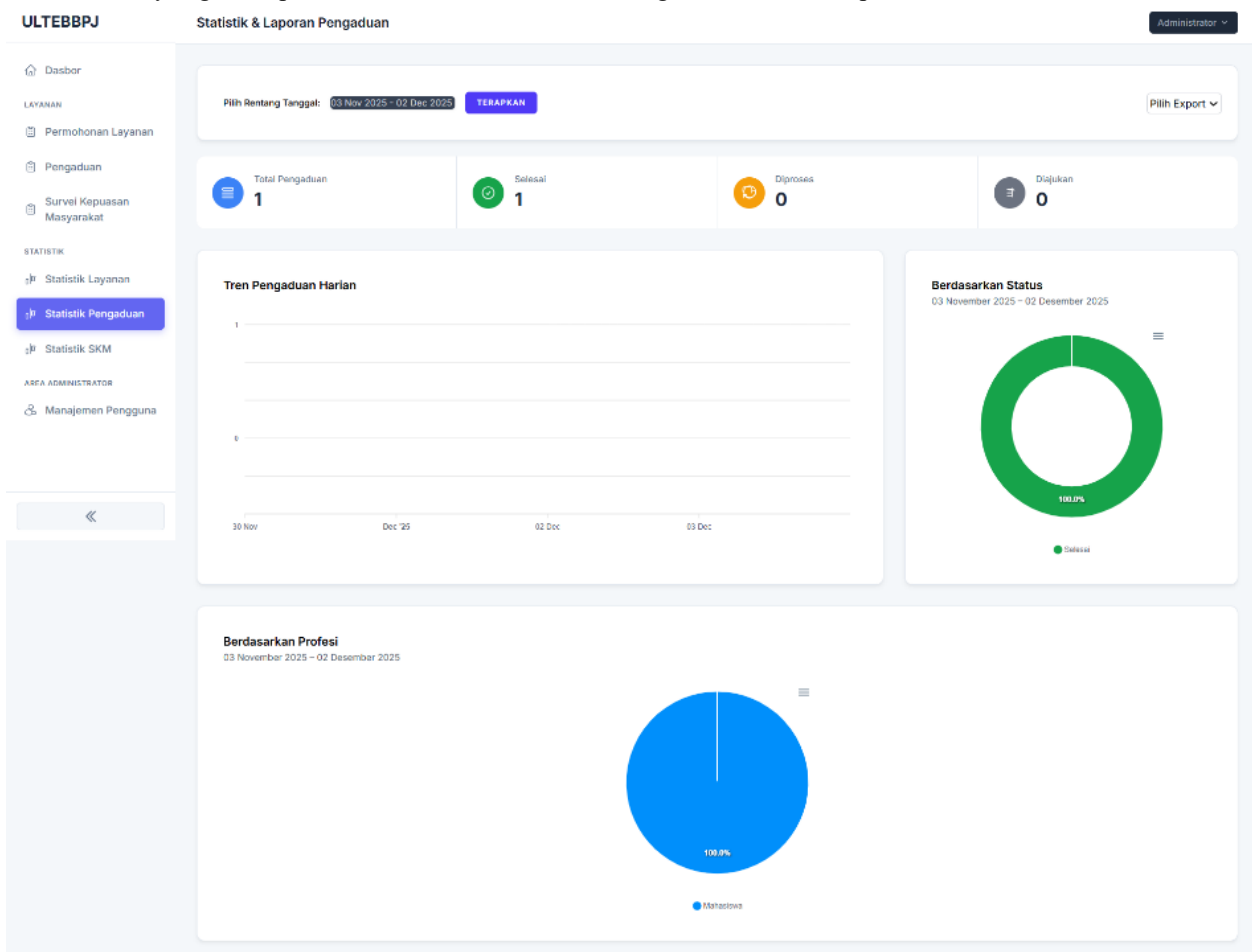


Fig. 5 Dashboard of Complaints

4. Dashboard Interface for the Public Satisfaction Survey

The prototype of the Public Satisfaction Survey (SKM) dashboard in Figure 7 presents visualizations that display



a range of performance indicators through structured visual features in the form of charts and KPI cards. This process includes arranging key indicators such as total respondents, total requests, satisfaction index, service quality, and category-based elements derived from the integrated database. Daily trend charts, status proportions, per-aspect score distributions, and average scores per category are designed to illustrate data patterns in a comprehensible visual structure. The category chart includes a drill-down feature for more detailed data exploration, as shown in Figure 6tab. Additionally, the SKM recap table per service element is designed to display detailed IKM calculations by service unit, enabling the dashboard to present structured information on aspect-wise score distribution, user recommendation levels, and overall service scores. Thus, all visual elements displayed on the dashboard represent ETL outputs in a structured and analytically coherent form. A printout feature is also added to support concise reporting.

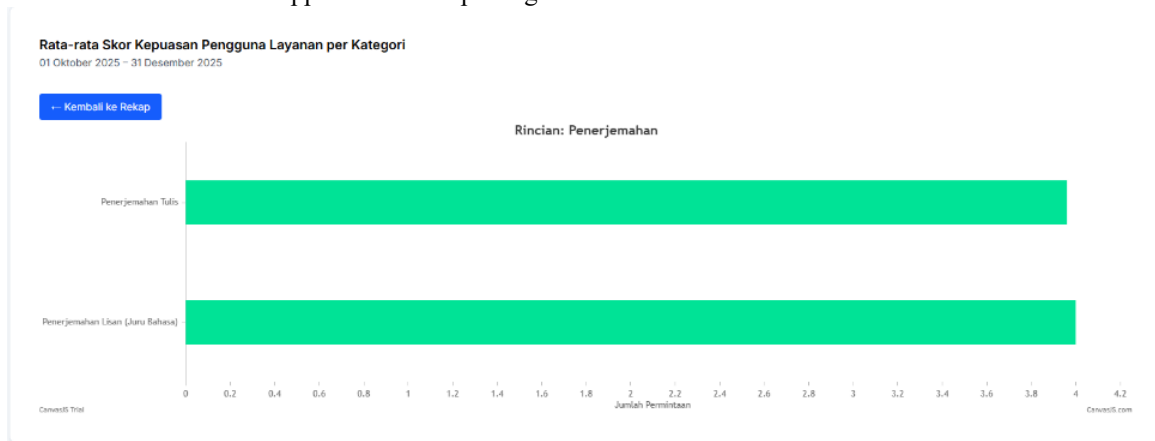


Fig. 6 Prototype Drilldown Satisfaction Average

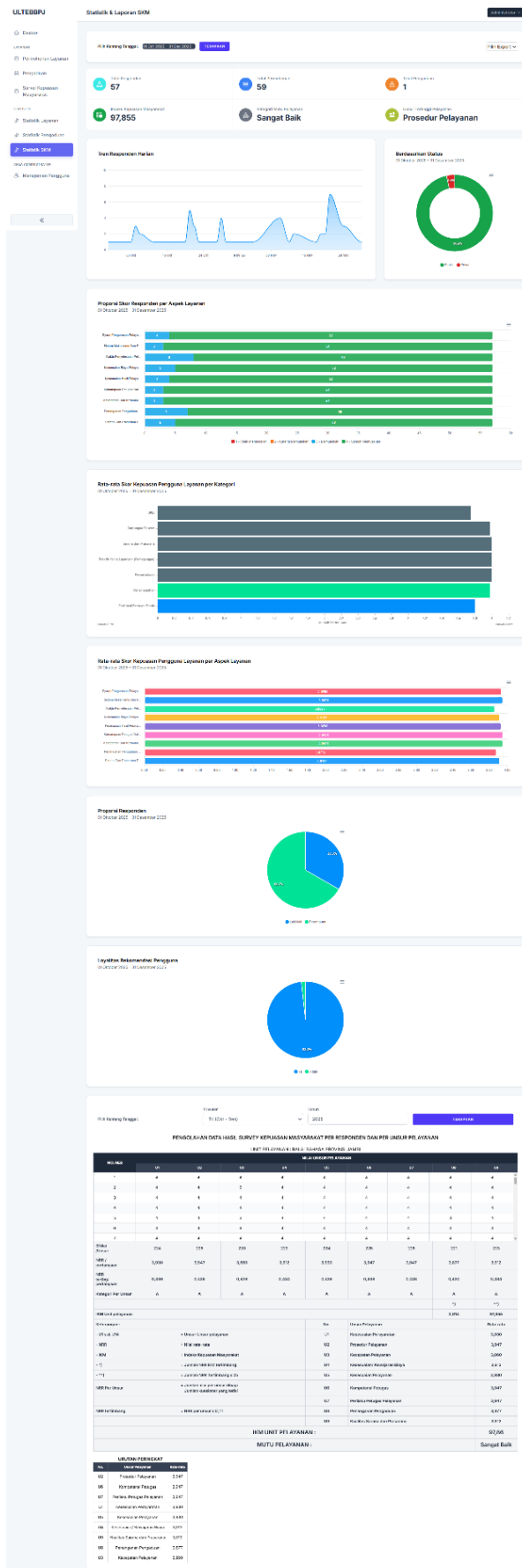


Fig. 7 Dashboard of Public Satisfaction Survey



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Refinement

The testing applied in this phase is the System Usability Scale (SUS), which evaluates usability aspects through ten standardized questions using a five-point scale. This evaluation involves three internal respondents who possess authority in system utilization, enabling the assessment to be conducted from the perspective of users familiar with operational workflows. The respondents' answers are presented in a response table, an SUS score-conversion table, and a final-score table. These tables are used throughout the refinement process to ensure that the visual presentation and interaction flow of the dashboard are comprehensible and operable according to the intended design.

Table 3. SUS Questionnaire Responses

Respondent	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
R1	5	3	5	3	5	3	5	3	5	3
R2	5	3	5	3	4	3	5	3	4	3
R3	4	3	4	4	4	4	4	3	4	3

Table 4. SUS Conversion and Average Scores

Respondent	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Raw Score Σ	SUS Score (Σ × 2.5)
R1	4	2	4	2	4	2	4	2	4	2	30	75,00
R2	4	2	4	2	3	2	4	2	3	2	29	72,50
R3	3	2	3	1	3	1	3	2	3	2	28	70,00
Average												72,50

The three respondents produced an average SUS score of 72.50. This score reflects how the dashboard design is perceived by users during the refinement stage and indicates that the tested functionalities operate as intended within the defined interaction framework.

Release

The release stage is conducted by deploying the dashboard into the operational environment, making it publicly accessible so that all functions previously tested in the development environment may be executed directly by users.

DISCUSSION

The findings of this research demonstrate that the application of the Pureshare Methodology successfully mapped the essential elements required for the development of service dashboards. These elements include the identification of performance indicators, the selection of appropriate visualization formats, and the structuring of display layouts tailored to user needs. Data integration through ETL processes within the service statistics module and citizen satisfaction surveys produced structured datasets that could be directly utilized to construct interactive charts, KPI cards, and supporting tables. In other modules, such as the complaints dashboard, the design was based on newly established database structures due to the absence of operational data during the research period. The implemented visualizations incorporated several core components, including daily trends, category distributions, service status proportions, and drill-down functions that enabled users to explore data more deeply within specific charts. Usability testing using the System Usability Scale (SUS) formed part of the refinement stage, revealing that users were able to follow interaction flows and comprehend the provided visual components. All dashboards developed were successfully integrated into the operational web interface. The application of the Pureshare Methodology in this research illustrates that dashboard development can be conducted systematically, even when data conditions and service characteristics vary across modules, provided that KPI elements, data sources, and visualization mappings are clearly defined from the outset of development.

CONCLUSION

This research concludes that the application of the Pureshare Methodology provides a structured framework for the development of web-based service dashboards. The methodology facilitates the identification of performance indicators, the selection of visualization types, and the organization of information hierarchies aligned with user needs. The implementation of ETL processes in the service statistics and citizen satisfaction survey modules resulted in integrated datasets that could be presented through interactive charts, KPI cards, and supporting tables. For modules lacking operational data, dashboard designs were still achievable by constructing new database structures, thereby maintaining consistency of presentation across modules. All dashboards developed were successfully integrated into the operational web interface, indicating that the research outputs are ready to be utilized as part of the institution's digital service system. Usability testing using the System Usability Scale (SUS) yielded an average score of 72.50, signifying that users were able to follow interaction flows and understand the main dashboard components. Overall, this research demonstrates that dashboard development can be systematically achieved despite variations in data conditions and



module characteristics, as long as the processes of need identification, visual design, and system integration are carried out consistently.

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