

# Empowering website-based information and service quality: the role of backend developer in village digitalization

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## ABSTRACT

In today's technology-driven era, this paper investigates the indispensable role of backend developers in empowering website-based information and service quality through digitization initiatives. As technology is critical in-service delivery and information dissemination, backend developers are crucial in developing robust and efficient systems. This paper emphasizes the importance of their position by examining their primary responsibilities, skills required, challenges faced, and their impact on improving the quality of website-based services and information in the digitization process. By studying the realm of backend development, this paper highlights the vital contribution made by backend developers in achieving effective digital transformation.

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## 1. INTRODUCTION

In today's digital era, where empowerment, quality service, and the availability of information are essential web-based factors, improving user experience and deploying efficient data have become paramount. As technology continues to play a central role in delivery services and communications, backend developers have emerged as key contributors to the success of digitization efforts. Their role in developing robust and efficient backend systems is critical in ensuring seamless operations and enabling practical information management. This research paper explores the significant role of deep backend developers in empowering quality services and facilitating web-based information in the context of digitization. By delving deep into the skills required, the challenges faced, and their impact on the digital transformation process, we aim to highlight the invaluable contributions of deep backend developers in facilitating service delivery and information deployment. This exclusive study sheds light on the multifaceted role of backend developers and emphasizes their profound influence on optimizing user experience and enabling digital transformation in the modern era.

The digitization of various industries and sectors has revolutionized how organizations interact with users and customers. For service-oriented entities, ensuring high service quality and providing accessible and relevant information has become paramount. Achieving these goals necessitates the development of efficient backend systems capable of handling complex operations, securing data, and seamlessly integrating with front-end interfaces without bottlenecks. The collaborative efforts of backend developers, developers, and front-end designers are essential in creating a cohesive user experience, ensuring smooth data flow, and optimizing system performance.

However, backend developers also face unique challenges in their roles. Dealing with security, scalability, and the fast-paced progression of technology presents several hurdles they must overcome to ensure

the effectiveness of backend systems. By addressing these challenges head-on, backend developers strengthen the foundation for empowering quality services and making website-based information readily available. Understanding the critical role of deep backend developers in digitization allows organizations to allocate appropriate resources and invest in developing the necessary skills to harness their expertise effectively. This paper seeks to provide an in-depth outlook on the multifaceted role of backend developers, emphasizing their profound impact on facilitating quality services and disseminating information in the dynamic context of web-based digital transformation..

## 2. THEORETICAL BASIS

### 2.1 Administration Village

Administration village refers to the body or system responsible for government answer for managing affairs in public towns or rural areas. Usually consists of officials elected or appointed to make decisions and carry out policy for the progress of the village and its inhabitants. Government villages are essential in guarding law and order, delivering service bases, and promoting development in the town. Followings are several aspect keys from the administration village:

#### 1. Council/ Village Council

Council or village council is the manufacturing body decision main in the government village. Usually consists of representatives selected, like the head village or mayor, and council members. They are responsible answer for making essential decisions, enacting Constitutions, or regulations, and allocating source Power For various projects and initiatives.

#### 2. Regional Government

Government villages operate as part of the government structure more area \_ wide in a country or region. This Possible responsible answer is to level more government \_ high, like administration reGENCY or district, and should obey relevant laws, policies, and guidelines.

#### 3. Basic Services

Government village responsible answer for ensure provision service important for citizen. This includes services like water supply, sanitation, transportation, general management and waste, facilities health, education, and maintenance infrastructure.

#### 4. Public Safety

Guard law and order are role other important in the administration village. They can form local police or coordinate with institutional enforcer law to ensure the safety and security of the village. They may also be the responsible answer for handling disputes locally, enforcing the regulations, and promoting initiative safety in society.

### 2.2 Development Application Web-based

Backend developers are essential in empowering service quality and facilitating the availability of website-based information in digitization. Proficiency in PHP, JavaScript, CSS, Rich Text Format (RTF), and template engines Blade equips backend developers with the necessary tools to create powerful and efficient systems. Each of these technologies contributes to different aspects of the development process and enhances web applications' overall functionality and user experience.

#### 1. PHP

Backend developers proficient in PHP use this server-side scripting language to handle dynamic content creation, form processing, and database interaction. They leverage PHP to create interactive web applications that can deliver personalized and dynamic content to users. With PHP, backend developers can implement complex business logic, process user input, and retrieve data from databases, enabling organizations to provide customized services and improve service quality.

#### 2. JavaScript

JavaScript is a multi-purpose programming language essential in increasing user interactivity and responsiveness in web applications. Backend developers proficient in JavaScript leverage its functionality to implement client-side interactions, validate user input, and facilitate communication with backend systems. They leverage JavaScript frameworks and libraries to create dynamic and interactive web experiences and increase user engagement and overall service quality.

### 3. CSS

CSS (Cascading Style Sheets) is a fundamental technology backend developers use to control web page visual presentation and layout. Backend developers proficient in CSS ensure consistent branding, responsive design, and intuitive user interface. They apply CSS techniques to customize the appearance of web elements, define layouts, and create visually appealing and user-friendly web interfaces. By effectively using CSS, backend developers contribute to improving aesthetics, usability, and quality of service.

### 4. Rich Text Format

(RTF): Backend developers proficient in RTF use this document file format to manage and format text documents. They can use RTF to effectively store and present website-based information, ensuring rich and structured content for users. By leveraging RTF capabilities, backend developers enable organizations to provide users with detailed and well-formatted information, increasing the accessibility, readability, and overall quality of website-based information.

### 5. Blades Templates engine

Blade is a powerful templating engine used in the framework Laravel PHP. Blade-savvy backend developers can create dynamic and reusable templates, increasing web development efficiency and maintainability. They leverage Blade features to separate presentation logic from business logic, enabling efficient rendering of web pages and consistent layout across multiple pages. With Blade, backend developers can streamline the development process, improve code readability, and ensure a cohesive user experience, ultimately contributing to improved service quality.

## 3. METHOD

### 3.1 Requirements

Study This is the backend design Website Official Village and features on the application This is what becomes a reference in a study. Following Features of the application cellular listed in Table 1.

Tabel 1 Website Spesification

No.	Spesification	Details
1	Information Page	The system can display village information such as articles and others
2	Data Management	The system can manage population data
3	Correspondance	The system can receive requests and letters from the public.
4	Assitace Program	The system can handle the assistance programs provided.
5	Endurance	The system can operate for 24 hours straight and in a state of many users.
6	Data Analysis	The system can operate for 24 hours straight and in a state of many users.
7	Data Center	The system can be connected to the data center

### 3.2 Design

#### 3.2.1. Flow chart diagrams

Describe the service process of government village. Starting from page porch, citizens process the NIK of incoming citizens. Inhabitants choose type letter for make letter request certificate sent to the operator as a template for government village. If the application letter is accepted, the operator selects the head authorized town to sign and send the letter information to the head village. If the mail application is rejected, the operator notes the reason for certification and sends an announcement or announcement to the citizen. On the page administration village, the chief town or secretary village enters the certificate management population with a digital sign from the head village or secretary village If the requested certificate has been accepted. If the application letter is denied, the chief town or secretary village will make a letter of information with the reason and send an announcement to the citizens.

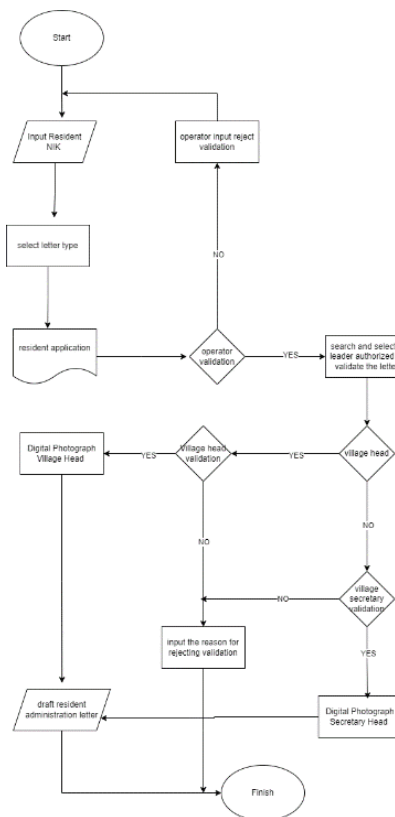


Figure 1. Village administration service flowchart

3.2.2. Use Case Diagram

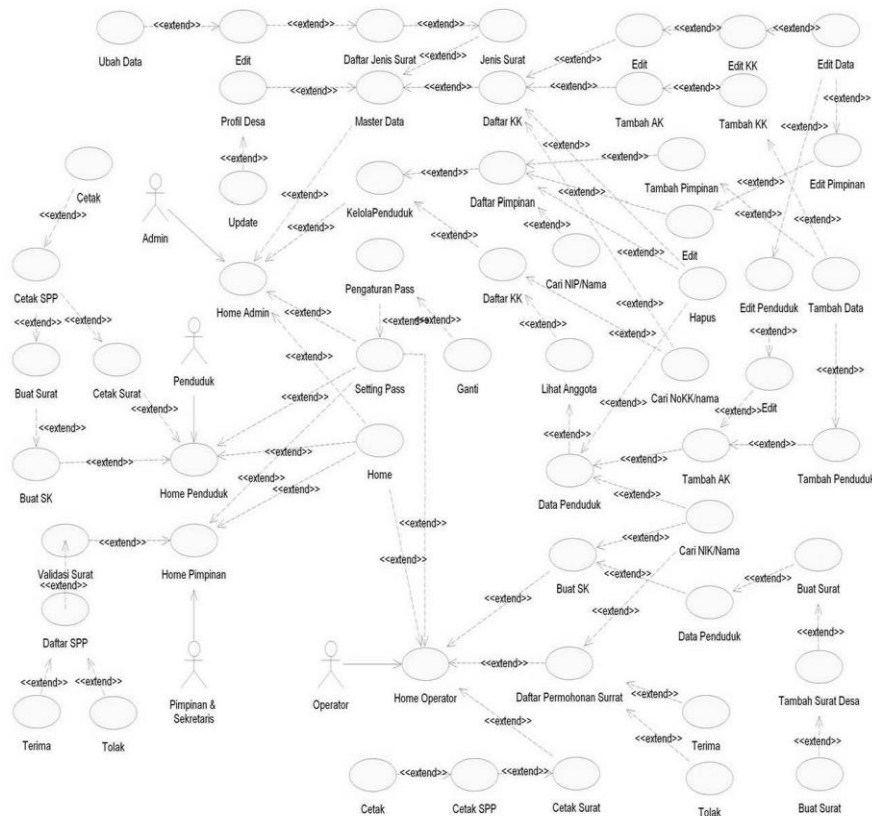


Figure 2. Use case of the village service information system web site

The picture above is a use case diagram for the Village Service Information System application. It was explained that there are actors from the village service information system application: administrator, operator actor, village head actor, village secretary actor, and resident actor. The admin actor has access rights to input village profiles, family card data, edit letter types, input letter types, input village leadership lists, input population data, and change passwords. The actor operator has access rights to make a statement, accept and reject a list of resident applications, print application letters validated by village leaders, and change passwords. Village head actors and village secretaries have access rights to validate application letters sent by operators. Resident actors have access rights to make application letters, print application letters validated by village leaders, and change passwords.

Activity diagrams describe the flow of activities in the system being designed, how each flow begins, the decisions that may occur, and how they end. The admin activity diagram is an activity that village government officials usually carry out. These activities include carrying out the login process; village profile updates; inputting, editing, and viewing family card data; editing the type of letter entitled to sign a resident application letter; inputting, editing, and considering the list of village leaders; viewing, input, edit and delete population data; changing passwords; and perform the logout process.

Activity diagram operator is an activity that village government officials usually carry out. These activities include making certificates offline; accepting and rejecting the list of resident applications; printing a certificate validated by the village head; changing passwords; and performing the logout process. The leader activity diagram is an activity that is usually carried out by the village head and village secretary. These activities include validating the resident application letter sent by the operator and carrying out the logout process.

### 3.2.3. Data Flow Diagrams

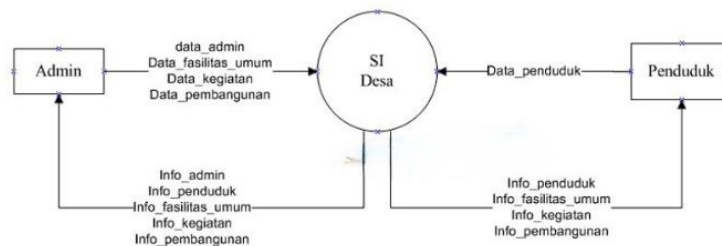


Figure 3. Data Flow Diagrams Level 0

#### Stakeholders:

- Admin Users: These are the operators who run the application. They can access various features and functionalities to manage the village system effectively.
- Residents: These are passive users who provide information related to population data. They interact with the system by submitting their data.

#### Data Flows:

##### a. Data Entered by Admin Users:

- Admin Data: Information about admin users (e.g., username, password, contact details).
- Public Facilities Data: Details about public facilities available in the village (e.g., schools, hospitals, parks).
- Activity Data: Information about village activities and events.
- Development Data: Data related to the village's ongoing or planned development projects.

##### b. Data Entered by Residents:

- Population Data: Data provided by residents includes information such as name, age, address, family size, etc.

Data Received by the System: The system receives various data types from admin users and residents. This data is crucial for managing and maintaining the village system effectively.

- Resident Info: Information residents provide during registration or updates to their profiles (e.g., personal details).
- Admin Info: Information about admin users that they provide during registration or profile updates.
- Facility Info: Details about public facilities submitted by admin users.
- Activity Info: Information about village activities and events entered by admin users.
- Development Info: Data related to ongoing or planned development projects submitted by admin users.
- Population Data: Information provided by residents regarding the population data of the village.

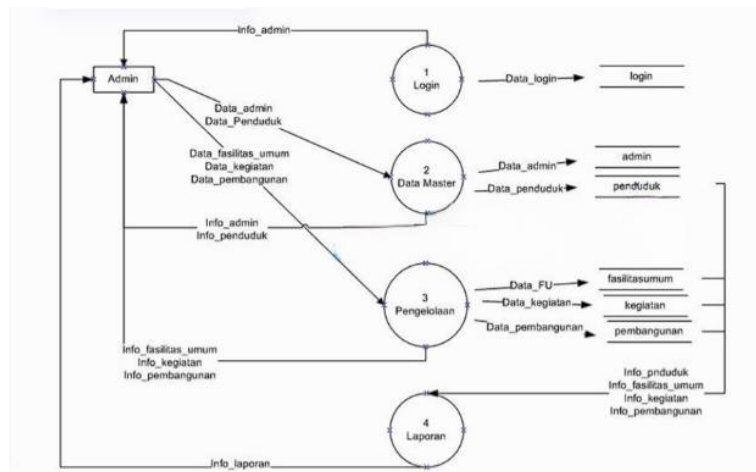


Figure 4. Data Flow Diagrams Level 1

#### Stakeholders:

- Admin User: The only user level in the system. The admin user can log in, enter data, manage various aspects of the village system, and generate reports.

#### Data Flows:

##### a. Admin User Data Flows:

- Admin Login Credentials: Information the admin user, provides during login to access the village application.
- Admin and Resident Master Data: Data entered by the admin user containing details of admin and resident profiles.

##### b. Admin Processes Data Flows:

- Public Facilities Data: Information entered by the admin user about public facilities in the village.
- Activity Data: Details of village activities entered by the admin user.
- Development Data: Data related to development projects in the village, entered by the admin user.
- Report Request: Request made by the admin user to generate specific reports.

##### c. Data Resulting from Processes:

- Public Facilities Info: Data generated from the "Public Facilities" process forms the basis of the Public Facilities table in the application database.
- Activity Info: Data resulting from the "Activity" process, forming the Activity table in the application database.
- Development Info: Data generated from the "Development" process, forming the Development table in the application database.
- Report Data: Resultant data from the "Report" process is used to generate reports.

### 3.2.4. Activity Diagrams

Figure 5 is a sequence chart illustrating the activity of average residents within a village society. This sequence chart captures the interactions between various objects and components within the system, including users, views, and other relevant entities. The activities depicted in the chart include:

- Making a letter application online.
- Printing it after the village head or secretary has reviewed it.
- Changing the password.
- Completing a checklist.

The sequence diagram is designed to show the chronological order of events and the communication flow between the different components. The vertical dimension of the sequence diagram represents time, showing the progression of activities from top to bottom. Each step corresponds to a specific action or interaction within the system.

The horizontal dimension of the sequence diagram represents related items or entities involved in the interactions. These entities can include the user, the system's views, the village head, the secretary, and any other objects relevant to the activities.

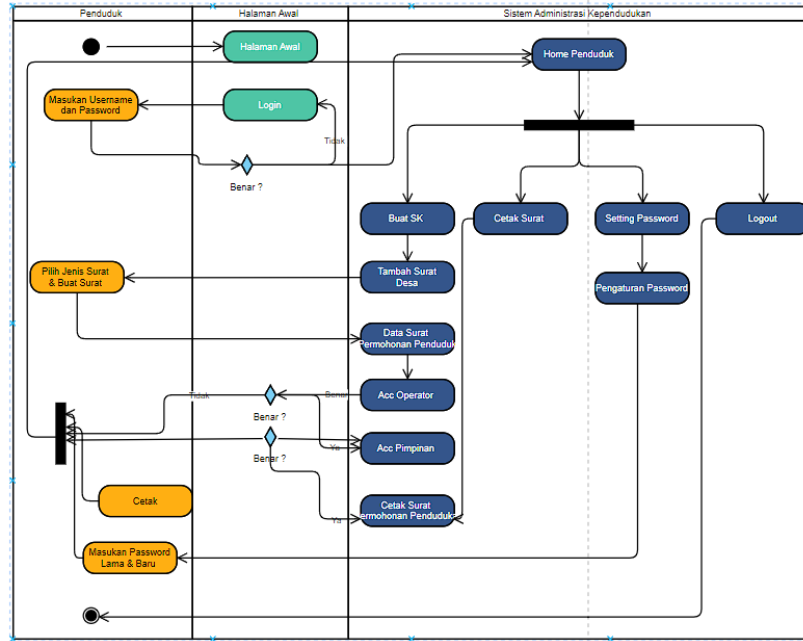


Figure 5. Population Activity Diagram

## 4. RESULTS AND DISCUSSION

### 4.1 Implementation

#### Articles and Information

Articles page is the home page of there, System Information Village Sindangresmi. Where on the page, there is various type of articles published by the admin that give information and news to users. \_ On the page, this also exists center information general village such as the village agenda, population number, regulation, vision mission village, and other information.

The sub-system is used For the public general to know various information about village Sindangresmi. On the page This used For page System homepage \_ Information Village and also put feature heading navigation \_ to Service Independent For public do various requests like mailing and others village without must come to office village.

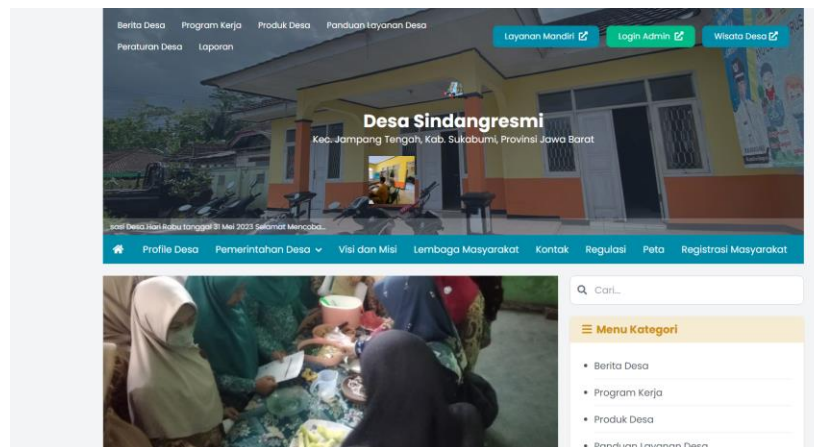


Figure 6. Website Home Page

#### Self Service

On the sub-system service, This independence can be used by the people who own it to contact the village. To access service independently, the community is required to enter the NIK and pin that the town has given. A moment after the user managed to log in to the service standalone, the user was required to change the default pin from the village to the personal pin.

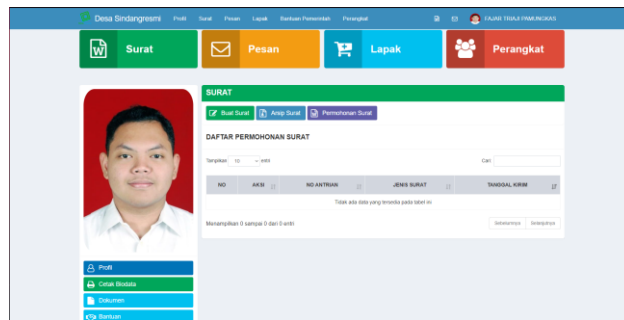


Figure7. Independet services home page

**Administrator**

The admin sub-system is a page intended for village officials where with different authorities, each apparatus can only access information according to their respective sources. On this page, the admin can manage all information and data in the village and do their job more easily.

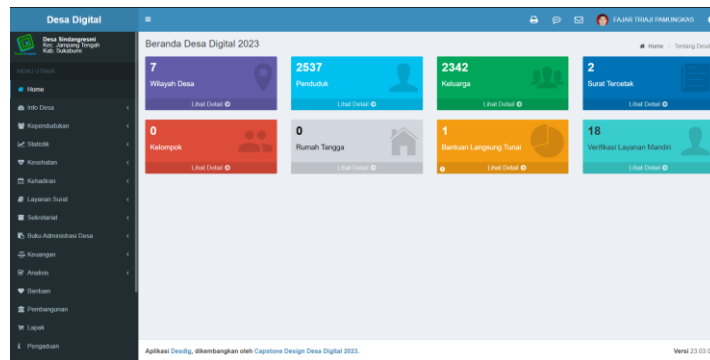


Figure 8 Administrator dashboard

**4.2 Testing**

Testing, in the context of software development, refers to the process of evaluating a software application or system to identify defects, errors, or discrepancies between expected and actual behavior. The main purpose of testing is to ensure that the software functions correctly, meets specified requirements and provides a satisfactory user experience.

**Navigation Testing**

Navigation testing is used to check whether, when the panel is pressed, it can direct to the intended page. Navigation testing is a crucial aspect of web application testing that focuses on ensuring the proper functioning of links and buttons within a web page or application. Navigation testing aims to verify whether clicking on various elements, such as buttons, hyperlinks, or menus, correctly leads users to the intended destination or page.

Table 2. Navigation Testing

No.	Scenario	Result
1	Navigation test can redirect to the appropriate page	pass
2	Test all items are operable	pass
3	information can be shown	pass



### Data Management Testing

Data management testing is used to test whether data in the system can be added, deleted, and re-edited. Data management testing is a vital aspect of software testing that focuses on verifying the proper handling of data within a system or application. The primary objective of data management testing is to ensure that data can be accurately and securely added, deleted, and edited within the system, without any loss or corruption of information.

Table 3. Data Management Testing

No.	Scenario	Result
1	Data can be added	pass
2	Data can be deleted	pass
3	Data can be edited	pass

### Attachment Testing

attachment testing is used to test all existing views whether they are in accordance with those set by the admin or not. Attachment testing is a significant aspect of software testing that focuses on validating the correct handling and display of various attachments within a web application or software system. Branches refer to files or documents that users can upload or associate with specific records or entities in the application. These attachments can include images, videos, documents, spreadsheets, and other file types.

Table 4. Attachment Testing

No.	Scenario	Result
1	attachments can be added	pass
2	attachments can be deleted	pass
3	attachments can be edited	pass

## 5. CONCLUSION

The role of the backend developer is vital in empowering information based on website and quality service during the digitization process village. By adopting the waterfall method, which gives an approach structured For development device soft, the town can, in a manner, effectively increase its online presence and improve the quality of information and services offered \_ via its website. Involvement backend developers started with collection requirements, where they collaborate with stakeholders' interests To understand the purpose and required functionality \_ for websites. They Then continue to design systems, where they create backend infrastructure, including databases, servers, and APIs, ensuring scalability and performance. Implementation involves coding current and development backend components to be sure that logic For storage, processing, and retrieval of data is implemented efficiently. Testing is vital in identifying and fixing the problem or any bugs in \_ backend functionality, ensuring optimum performance and reliability.

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