

Deliver Secure and Fast (DSF) Requirements Specification



Author: Mustafa Habeb
Email: Mh224tb@student.lnu.se

Contents

1. System Requirements	4
2. System Interfaces	5
2.1. User Interfaces	5
2.2. Interfaces to External Systems or Devices	6
3. Business Rules	6
3.1. Customer Loyalty Discount Rule-001	6
3.2. Customs Compliance Check Rule-002	6
3.3. Parcel Damage Claim Rule-003	6
4. System Constraints	7
5. Use-Cases	7
5.1. Use-Case: Sending a Trackable Parcel for a Private Customer Use	7
5.2. Use-Case: Business Customer Sending a Parcel	8
5.3. Use-Case: DSF Staff Returning an Undelivered Parcel.	9
.	10
Appendix – Time Report	10

1. System Requirements

Stakeholders and their principal concerns:

1. Business customers: logistic system with high efficiency and scalability, integrates easily with e-commerce, handel international shipping rules, and support sustainability.
2. individuals customers: customer service quality, acceptable and appropriate prices, and reliable, safe, and timely deliveries
3. Regulatory Authorities: ensure that the DSF follows environmental, data protection, shipping rules and easy customs handling.

Functional requirements:

- FR-1. User account management: the system should enable both individuals and business customers to create, manage, and delete their accounts.
- FR-2. Subscription management: the system should provide deferents service levels and types and give the facility to the users to choose and subscribe to services that fit their specific needs.
- FR-3. Parcel Tracing: the systems should provide a tracing service to help the users to track theirs parcel from the collection to delivery in real time by using a unique tracking number.
- FR-4. Delivery scheduling: the user should be able to schedule the deliveries and pickups of parcels, by specifying times and location.
- FR-5. Delivery notification: the system should provide this service by sending a text message or email alerts about the delivery status (estimated delivery time, notification upon parcel arrival or delay)
- FR-6. Return management: users should have the facility to easy, simple, and label-free returns.
- FR-7. Customs regulation assistance: in case of international shipments the system should automatically generate or help to provide the necessary documentations and offer guidance on compliance.
- FR-8. Goods and cargo transport: the systems should provides various shipping options for parcels within Sweden and internationally, including home and business parcels delivery, at the same time the delivery to service points with specific size and weight restrictions.
- FR-9. Security check: all parcels collected by DSF must undergo a security check, with the process documented in the system for future tracking and verification.
- FR-10. Payment processing: The system should facilitate secure online payment options, including Swish and Klarna for transactions within Sweden, and PayPal for international dealings.

Non-functional requirements:

- NFR-1. Scalability: The system should have the ability to adjust its infrastructure to manage the fluctuations, ensuring optimal operation during peek periods like holidays and sales events.
- NFR-2. Reliability and Timeliness: The expected delivery times are provided for various services, indicating a focus on timely and viable delivery.
- NFR-3. Availability: The system should guarantee high availability, ensuring the system is operational 24/7 with minimal down time.
- NFR-4. Security: System must has a robust security measures to provide a reliable protection for sensitive user data and transaction information against unauthorised access and other cyber threats.

Checklist for the Requirements Analysis:

1. Clarity: Are the requirements clearly and and unambiguously stated ?
2. Completeness: are all necessary functionalities and constraints comprehensively covered by the requirements?
3. Consistency: Are there any conflicts between the requirements ?
4. Feasibility: Is it practical to implement the requirements.?
5. Relevance: Are the requirements align with system propose?
6. Security: Do the requirements cover the system and data security.

7. Scalability: Do the requirements support system scalability and peak load handling?

Check process: the process involved reviewing each requirement against the check list items.

Issues: The security requirement “NFR-4” it is general and it lacks specifics on encryption, data handling, and access; it needs detailing on these measures for comprehensive protection which is crucial for robust defence and legality.

systematic validation:

The analysis process: each requirement was reviewed to insure it fully follows *the checklist* (Completeness of requirements, consistency of requirements, comprehensibility of requirements, ambiguity of requirements, structure of the requirements document, traceability of requirements, conformance to defined standards).

issues:

Ambiguity of requirement: "Goods and cargo transport" should specify what constitutes "specific size and weight restrictions."

2. System Interfaces

2.1. User Interfaces

The system should provide responsive web and mobile interfaces for both customers and employees. This interfaces should comply with accessibility guidelines and be compatible with the latest version of leading browsers.

communication protocols HTTP/HTTPS for web interactions, with SSL/TLS encryption for data security.

2.1.1. Look & Feel

The application interface is designed to be Stylish, modern, and user friendly, with a cooler scene that symbolising dependability and reliability and clear visibility. The interface should be straightforward, enabling effortless browsing for both individual and business users, guaranteeing that the application is fully useful across devices and adheres to accessibility standards (WCAG2.1)

2.1.2. Layout and Navigation Requirements

The interface is set to feature a dashboard that allows access to essential features like: tracking parcels, managing accounts, subscribing to services, and scheduling deliveries. A bottom navigation bar will be implemented on mobile devices, while a sidebar menu will be used on desktop versions to facilitate navigation and ensure users can easily move between features.

2.1.3. Consistency

The interface will employ consistent design elements such as specific button styles and font selections across the application. Familiar patterns from e-commerce and courier services, such as shopping cart icons for parcel handling and bell icons for alerts will be used to enhance user intuition.

2.1.4. User Personalization & Customization Requirements

The application will offer personalisation options such as customisable dashboard widgets to display favoured functions (frequently used shipping paths, favourite delivery options) and the ability to save the commonly used recipient address. Users will have the option to switch between a light and dark theme catering to their visual preferences for better comfort.

2.2.Interfaces to External Systems or Devices

The system will interface with:

Payment gateways: the system will use Swish for local payments and PayPal for international transactions, employing secure APIs via HTTPS. Protocols for data encryption and authentication method (such as OAuth2.0) will guarantee safe secure and reliable financial transactions.

GPS and Mapping Services: integration with the Google Maps API to provide real-time tracking information and route optimisation for deliveries.

2.2.1.Software Interfaces

CRM software: Utilises RESTful APIs for real-time syncing of customer data, support inquiries, and feedback, with security via API keys and HTTPS.

Logistics and inventory management: Streamlines parcel management, inventory tracking, and returns, using XML/JSON for secure interoperability (HTTPS/SOAP) with logistics partners.

2.2.2.Hardware Interfaces

Barcode Scanners: Used in warehouses and at retail partner sites to scan parcel labels, connecting with the DSF system via Bluetooth or USB for straightforward integration.

2.2.3.Communications Interfaces

For office and warehouse operation LAN and Wi-Fi Networks which support standard TCP/IP protocol for internal network communications. Security measures will include WPA2 for WiFi and the use of VPNs to ensure data integrity and confidentiality.

For realtime communication with delivery personnel Cellular Network, using encrypted data transmission over 4G/5G networks.

3. Business Rules

3.1.Customer Loyalty Discount Rule-001

If an individual customer successfully complete at minimum of 12 deliveries within the past year, then offer 6% discount on their next delivery as token of appreciation for their loyalty.

3.2. Customs Compliance Check Rule-002

If a parcel destined for international delivery include items that are subject to customs regulations, then automatically produce the necessary customs paperwork and make the parcel for further inspection.

3.3. Parcel Damage Claim Rule-003

If a customer submits a report of parcel damage within seven days and provides photographic evidence of the damage, then the system should automatically register a damage claim and alert the customer service team to follow up.

4. System Constraints

Tech stack and platform infrastructure:

To ensure the compatibility with infrastructure and and to capitalise on the development teams expertise the system should be developed using a specific technology stack. In another words the backend of the system must be implemented using Node.js for the server side login, MongoDB for data Storage to ensure fast processing and scalability. While the frontend should be build using React for web applications and React Native for mobile applications to provide a seamless user experience across platforms.

Compliance and Security:

The DSF system must comply with GDPR, PCI DSS, and local regulations, ensuring data protection and secure payment processing. It requires end-to-end encryption, GDPR-compliant data storage, adherence to PCI DSS with security audits, and strong authentication mechanisms like OAuth 2.0 and 2FA. These mandates are crucial for a secure, compliant, and user-trusted service, influencing DSF's architecture and operational practices.

Environmental Sustainability:

All the digital solutions must prioritise energy efficiency in both terms of server usage and client-side operations. The selection of system hardware should components, such as scanners, should be based on their energy efficiency and sustainability credentials. It is crucial that the system promotes the adoption of sustainable packaging and delivery methods, integrating such options effortlessly into the user experience.

5. Use-Cases

5.1.Use-Case:Sending a Trackable Parcel for a Private Customer Use

5.1.1.Brief Description

Allows a individual costumer to send a parcel that can be tracked visa the DFS system, providing a range of delivery and tracking alternatives.

5.1.2.Actor Brief Descriptions

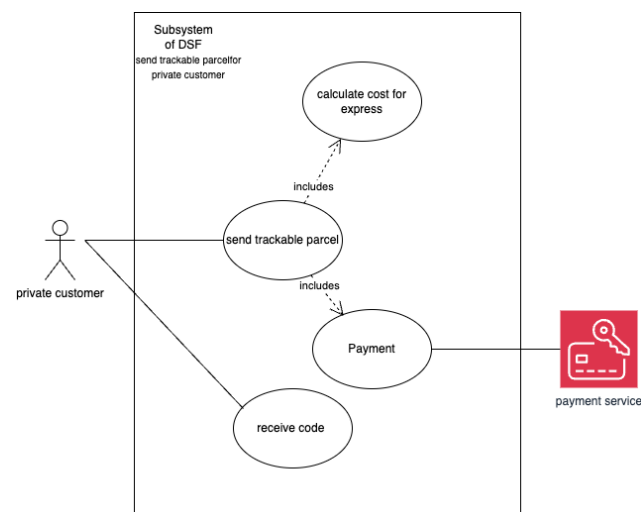
Private customer

5.1.3.Preconditions

Customer has registered an logged into the system and has a parcel ready for dispatch.

5.1.4.Basic Flow of Events

1. The use case begins when private customer, select the option to send a new parcel.
2. The customer enter parcel destination and details such as size and weight
3. The customer chooses from the available delivery options, including trackable shipping.
4. The customer selects additional services, such as insurance.



5. Customer pays for the service after conforming details.
6. The use case ends when the customer receives a confirmation message with the tracking number and service details..

5.1.5. Alternative Flows

Express Delivery Selection:

If in step 3 of the basic flow the actor selects the express service, then

1. The system recalculate the cost based on the express service pricing .
2. This recalculated cost, along with the previously selected tracking and insurance is presented to the customer.
3. The use case resumes at step 5.

5.1.6. Post-conditions

The customer receive confirmation of the shipment and can track the parcel using the provided number after the parcel was register in the system with a unique tracking number.

5.1.7. Special Requirements

Real-time calculation of the delivery costs based on the parcel size, weight and chosen options.

5.2. Use-Case: Business Customer Sending a Parcel

5.2.1. Brief Description

The business customers like H&M, Ikea, Amazon to send parcels with various delivery options, including drone delivery, instant delivery, or delivery to a nearby collection point.

5.2.2. Actor Brief Descriptions

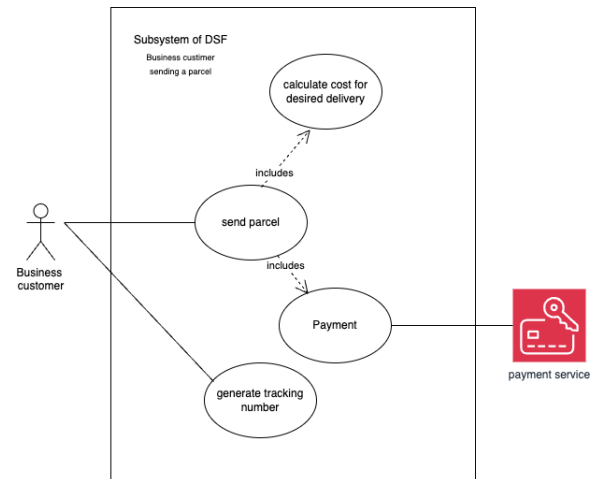
business customers.

5.2.3. Preconditions

Business Customer has a business account with DFS.

5.2.4. Basic Flow of Events

1. The use case begins when the Business Customer logs into their DFS account.
2. The customer enters the details of the new parcel after select the option to send a new parcel.
3. Customer chooses specialised business delivery options.
4. DFS calculates the cost based on the selected options.
5. Customer confirms the shipment and completes payment.
6. The system provides a tracking number and expected delivery details.
7. The use case ends when the customer receives a confirmation message with the tracking number and service details.



5.2.5. Alternative Flows

If in step 3 of the basic flow the customer chooses a drone delivery, then

1. If not available.

2. Notifies the customer.
3. The use case resumes at step 3.

5.2.6.Post-conditions

Business Customer can track the parcel's journey, after it is dispatched with the selected option.

5.2.7.Special Requirements

Integration with logistics for drone delivery and real-time tracking.

5.3.Use-Case: DSF Staff Returning an Undelivered Parcel.

5.3.1.Brief Description

DSF staff processes the return of an undelivered parcel to its sender due to incorrect address or unavailability of the recipient.

5.3.2.Actor Brief Descriptions

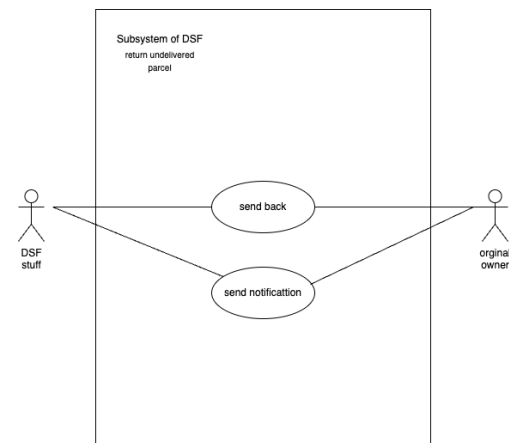
DSF staff.

5.3.3.Preconditions

- The parcel delivery attempt was not successful.
- The reason for the parcel's non-delivery (incorrect address or recipient unavailability) has been identified and recorded in the DSF system.
- The address and contact details of the sender are accurately saved in the DSF system.

5.3.4.Basic Flow of Events

1. The use case begins when DSF staff, marks a parcel as not delivered.
2. DSF staff retrieve sender details from the system.
3. The staff creates a new return process in the system.
4. Sends a notification to the original sender about the return procedure.
5. Sends back the parcel to the sender.
6. The use case ends after the sender receives notification confirming the sending of the parcel.



5.3.5.Alternative Flows

If in step 3 of the basic flow the recipient contact DSF requesting redelivery and provides the correct address or confirms availability for pickup, then

1. DSF staff pause the return process.
2. DSF staff enter the new delivery details into the system.
3. DSF staff schedule a redelivery and notify the recipient of the new delivery attempt.
4. The use case resumes at step 6

5.3.6.Post-conditions

The parcel is either successfully sent back to the sender or prepared for redelivery based on the updated information provided by the recipient.

5.3.7.Special Requirements

The system should allow the staff to easily update the delivery instructions and handle redelivery requests, ensuring the procedure is efficient and responsive to recipient actions.

Appendix – Time Report

Date	Member	Activity	Time (hours)
The preparation of the report was divided into four days	Mustafa Habeb	Preparation process	Max 4 hour per day
2024/2/12	Mustafa Habeb	Writing the report	8
2024/3/16	Mustafa Habeb	Fixing the report according to the feedback	4