

# GROUP 22

## Team Document

COMP 1712 · Set F

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# 1. Team Working Standards

## Set F – Group 22 | Members:

- Finn Wylie — A01455692
- Faye Liu — A01309734
- Austyn Chan — A01401624
- Fara Halterman — A01480744
- Kelsen Alloway — A01435664

## Communication

- Primary channel: Discord (COMP 1712 team server)
- Response time: weekdays  $\leq 12$  h; weekends/holidays  $\leq 24$  h
- Tight schedules — set tasks/deadlines ahead of time
- Communicate immediately if you need someone else to finish before you can continue
- If ever unsure, ASK

## Decision-Making

- If the decision will not affect others, decide independently
- Any change of direction requires group discussion
- "Good Enough is Good Enough"

## Conflict Resolution

- No such thing as a "Dumb Question"
- All conflicts handled as a group
- If things escalate, bring in a teacher
- If anyone raises a voice, take a group time-out

## Meetings

- In-person meetings require advance planning — no ad hoc meetings
- Fara keeps meeting minutes
- Meeting agenda circulated beforehand

## AI & Academic Integrity

- Transparency and following class requirements

## Team To-Do List (Lab 3)

Item	Lead	Due Date
Stakeholder Table	Fara	End of lab
Initial Features / Requirements List	Austyn	End of lab
System Request	Faye	End of lab
Feasibility Analysis	Finn	End of lab
Benefits / Cost Table	Kelsen	End of lab

## 2. System Request

<b>Project Sponsor</b>	Ivor Merck – Managing Director, Target Enterprises (Pty) Ltd
<b>Business Need</b>	<p>Unstreamed and physical work processes.</p> <p>Improve organisation and accessibility of customer information.</p> <p>Data quality issues (duplicate records, inconsistent addresses) result in increased costs.</p> <p>Current paper-based processes slow order intake and status enquiries.</p> <p>Support scalability for expansion across South Africa and internationally.</p> <p>Improve efficiency in managing orders, distribution, and customer communications.</p> <p>Better tracking of customer tastes, preferences, and purchase history.</p>
<b>Business Requirements</b>	<p><b>Customer Information Management:</b> Maintain customer list and demographics; capture order history, preferences, and shopping behaviour; group customers by preferences and predict future purchases; identify and remove duplicate data.</p> <p><b>Ordering &amp; Inventory:</b> Process and manage incoming/outgoing orders; track distribution and dispatch details; order and receive goods efficiently.</p> <p><b>Automation &amp; Integration:</b> automate printing (labels, customer info for catalogues); integrate POS, bookkeeping, payroll, and accounting systems; produce performance and preference reports; enable online access.</p> <p><b>System Features:</b> Scalable and future-proof; secure access with clearance controls; compatible with existing systems; easy for staff to use with minimal hardware requirements; support for multilingual interfaces.</p>
<b>Business Value (Qualitative)</b>	<p>Expand market reach from Cape Town to all of South Africa (and beyond).</p> <p>Increased staff efficiency and reduced manual errors.</p> <p>Reduced paperwork, postage, and catalogue duplication.</p> <p>Improved customer experience and satisfaction.</p> <p>Better insights into customer and market trends.</p> <p>Cost savings through reduced labour, operating costs, and reliance on third-party tools.</p> <p>Stronger integration across departments.</p>
<b>Special Issues / Constraints</b>	<p>Staff training required before system go-live.</p> <p>Transition from manual to digital processes will be significant.</p> <p>Current customer data requires restructuring.</p> <p>Existing hardware may not support modern systems.</p> <p>Payroll and accounting systems do not currently align with order systems.</p> <p>Implementation must prioritise ease of use and minimal disruption.</p>

### 3. Stakeholder Table

Stakeholder	Role / Org	Information Needs	Influence	Interest	Comm. Channel
Champion (Ivor Merck)	Target Enterprises Director	Overview of costs/benefits	High	High	MS Teams, weekly brief, in-person, email
Marketing Manager (Michelle Li)	Target Enterprises Marketing	Customer list incl. addresses	Medium	High	Weekly brief + email (walkthrough, clickable screen)
Finance Manager (Kate Merck-Vance)	Target Enterprises Finance	Cost of goods; shipping costs; project cost; payment batch reports	Medium	Medium	Weekly brief
System Users	Target Enterprises Staff	Processing incoming orders; dispatch to customers	Low	High	Surveys, interviews, testing
Singapore Org	Investor	Expansion / financial clarity	Low	High	Project sponsor as go-between
Customers	End User	—	Low	Med/High	Not directly; through Marketing Manager

## 4. Feasibility Analysis

### Technical — Can we build/integrate it?

- The network is patchy, especially around dispatch, and shared PCs are causing congestion. Network and machine upgrades may be needed.
- A unified customer purchase history system is required. Current lack of purchase visibility limits targeting and customer service.
- Manual paperwork and re-keying slow operations and lead to errors. A digital order system could improve flow and accuracy.
- Digital carrier tracking and visibility into shipment status are needed to replace paper slips used by dispatch.
- Operations teams have requested a single-screen view of dispatch details to improve usability.
- Integrating with the online order system is essential to reduce duplicate records and streamline processing.

### Economic — Should we build it?

- Cleaning up duplicate records and normalising addresses would reduce costs from returned mail, incorrect deliveries, and customer dissatisfaction.
- Moving from manual to digital workflows will save time and reduce error rates in order processing.
- Improving tracking and ensuring accurate order fulfilment will improve customer experience.
- Training is a necessary economic cost — essential to avoid user frustration and ensure smooth adoption.

### Organizational — Will they use/support it?

- The marketing manager is highly engaged and wants to see a working prototype early to provide feedback.
- Leadership expects weekly checkpoints and visible progress (e.g., screenshots or working demos) to show stakeholders.
- The marketing team sees address cleanup and duplicate prevention as a key early win — invested in a successful Phase 1.
- Changes must not disrupt critical financial and dispatch workflows, especially around month-end. Some artefacts must remain paper-based for now.
- Purchasing needs stock movement visibility; finance is open to learning the system early.
- Dispatch staff will need to move from paper slips to digital carrier records to gain shipment visibility.
- Limited but growing interest in using data for marketing and targeting, pending better system support.
- Sponsor and operations want the official order form to remain unchanged in the initial rollout.
- Any transition to digital systems will require training, particularly for clean data entry by order clerks and marketing.
- Legacy processes and tools should not be altered too soon — staff rely on familiar systems to perform efficiently.

## 5. Benefits & Costs Table

Type	Description	Impact	Conf.	Contributors
Tangible Benefit	Reduced costs and errors from duplicate mailings (returns, postage, inconsistent addresses).	H-L	2-5	Kelsen, Fara, Finn, Faye, Austyn
Tangible Benefit	Reduced employee hours on paperwork / manual re-entry (finance + order clerks).	H-M	4-5	Kelsen, Finn, Faye, Austyn
Tangible Benefit	Increased marketing efficiency (clean mailing list, unified purchase history).	M-H	3-4	Fara, Finn
Tangible Benefit	Reduces errors in invoicing and results in faster, more consistent payments.	H	4	Fara
Tangible Benefit	Increased efficiency in operations (faster responses, clearer order visibility).	H-M	3-4	Kelsen, Fara, Finn, Faye, Austyn
Intangible Benefit	Improved staff morale, well-being, and reduced stress.	M	2-4	Kelsen, Fara, Finn, Faye, Austyn
Intangible Benefit	Better customer experience and satisfaction (fewer errors, less frustration).	H-M	2-3	Kelsen, Finn, Faye, Austyn
Intangible Benefit	Board confidence and scalability through early prototypes and previews.	M-H	3-4	Kelsen, Fara
Dev Cost	New hardware / network upgrades (shared PCs, patchy network).	M-H	3-4	Kelsen, Fara, Faye, Austyn
Dev Cost	Regular prototypes and quick updates (needed for board/sponsor).	H	4	Fara, Finn
Dev Cost	Initial employee training (adoption risk if familiar workflows change).	M	3-4	Kelsen, Finn
Dev Cost	Define fields, totals, and test cases for reports.	H	3	Faye, Austyn
Ops Cost	Ongoing support, integration, and scalability (APIs, analytics, multi-site rollout, advanced reporting).	L-H	3-4	Kelsen, Finn
Ops Cost	System maintenance (general assumption + later phase).	L-H	2-4	Kelsen, Faye, Austyn
Ops Cost	Adding purchase history / dispatch details (time-consuming, may need extra staff).	L-M	2-3	Fara, Faye, Austyn
Ops Cost	Stock movement tracking (warehouse/logistics staff time).	M	2	Faye, Austyn
Ops Cost	Short-term manual form entry (don't redesign in phase 1).	L	4	Finn

## 6. System Features & Requirements

### Phase 1 — Core Requirements

1. The system shall maintain a customer list without duplicates.
2. The system shall warn when a new entry with duplicate customer information is created.
3. Order enquiry screens shall load in under 2 seconds on older mobile devices.
4. The system shall display tracking information on the Order Enquiry screen.
5. The system shall never show full card numbers to support staff.
6. The system shall record carrier, service level, tracking number, ship date, and weight for each order.
7. The system shall generate financial totals by date and payment method — both daily and weekly.
8. The system shall not allow software releases on Fridays or at month-end.
9. The system shall back up daily and support roll-back to any point within the last 30 days.
10. The system shall maintain an audit trail of who changed what and when.
11. The system shall restrict access by role (support cannot access payment data).
12. The system shall always capture customer email and phone number.
13. The system shall store delivery addresses in a consistent format.
14. The system shall generate Stock Movement reports (items in/out).
15. The system shall generate Sales Summary reports (orders and revenue over a date range).

### Later Phases

- Handle incoming customer orders and dispatch them.
- Organise distribution information.
- Order new stock and receive goods from suppliers.
- Stock/ordering management.
- Link to finance/POS system.
- Accounting & payroll system integration.
- Budgeting and correspondence support.
- Easily accessible from multiple locations.

## User Stories

*Epic: The system must provide a centralised Customer Database that tracks preferences, purchase history, and eliminates duplicate records.*

### US-1 — As a Marketing Manager...

*View customer purchase history and preferences to create targeted campaigns.*

#### Acceptance Criteria:

- System shows purchase history per customer.
- Preferences (e.g., product categories) are stored and editable.
- Dashboard includes export options for easy data access and visualisation.
- Exports available in CSV and Excel formats.
- Filters available: date range, product category, customer segment.

### US-2 — As a Customer Service Representative...

*Quickly look up a customer's order details to respond accurately and efficiently.*

#### Acceptance Criteria:

- CSR can search by company name, name, email, or customer ID.
- Customer record displays full order history.
- Latest order status (pending, shipped, delivered) is clearly shown.
- CSR has read-only access; sensitive data is masked.
- System logs CSR access to customer records.

### US-3 — As a Data Entry Clerk...

*Have duplicate customer entries flagged and merged to avoid wasted time and postage.*

#### Acceptance Criteria:

- System automatically detects likely duplicate entries.
- Users can merge records without losing history.
- Confirmation required before deleting/merging.
- Warns if a new entry contains information already in the system.
- Audit and change logs available for merged records.

## **US-4 — As a Finance Officer...**

*Have customer data integrated with POS and finance systems to reconcile payments with orders.*

### **Acceptance Criteria:**

- Credit card numbers are hidden unless viewed by an account with the appropriate permissions.
- Personal data is hidden or obfuscated on publicly viewable displays.
- Customer IDs sync with the finance system.
- Each transaction is linked back to a customer record.
- Reports show sales by customer and by period.

## **US-5 — As a Secretary...**

*Access customer information easily to facilitate customer correspondence.*

### **Acceptance Criteria:**

- Search function available by name, email, or customer ID.
- System shows purchase history per customer.
- System integrates with mail/other communication systems.
- Automatic formatting of communication documents with customer information.
- Customer information available in multiple formats (envelope address, email format, etc.).
- Unnecessary confidential information is redacted or hidden.

## 7. Team Retrospectives

### Lab 4 Retrospective

#### What helped coordination/collaboration/communication?

- Team members felt comfortable asking questions, giving feedback, and raising concerns early.
- Shared objectives and timelines gave structure and focus.
- Clear division of tasks.
- Open communication and collaborative language.

#### What hindered it?

- Lack of caffeine.
- Fridays being very long days.
- Staying on schedule for each task to finish when wanted.
- People having different working speeds/initiation costs.
- Some members contributing more than others created imbalance.
- Rushed deadlines sometimes reduced the quality of collaboration.

#### Action for Next Lab

- Better develop and document the decision-making process, ensuring everyone is involved.
- Set a clear goal/deadline for each task.
- 

### Lab 5 Retrospective

#### What helped coordination/collaboration/communication?

- Ability to split up work has been great — trust each member to do their part, then review together.

#### What hindered it?

- Variety of motivation levels across the team.

#### Action for Next Lab

- Focus on completing the lab together and aim to finish it within lab time.
- If it takes longer, stay at school to finish on the same day.

### Lab 5 — Use Case Assignments

Team Member	Use Case
Kelsen	Record Shipment Details
Fara (R-12)	Capture Email and Phone
Austyn (UC-10)	Sales Summary Report
Faye (UC-4)	Export Customer Data — allows Marketing Manager to export filtered customer purchase history and preferences.
Finn (UC-14)	The system shall store delivery addresses in a consistent format.

## 8. Requirements Elicitation Strategy

To triangulate project requirement elicitation, the team has chosen to combine three methods:

- Structured interviews with key stakeholders — to gather qualitative insights.
- Direct observations of staff performing tasks — to capture real-world workflows and challenges.
- Targeted surveys with scaled response options — to quantify user preferences and measure satisfaction.

Data Source (Who)	Method (How)	Data Analysis Strategies
All managers	Interview	Human analysis
All staff / users	Survey	Automatic analysis with the survey system
Variety of positions (primarily end users)	Observational	Report

### Rationale

- A survey efficiently gathers broad feedback across multiple staff members, especially frontline workers.
- Interviewing managers gives a departmental overview of system requirements with fewer resources than interviewing all users.
- Observation provides real-world context by watching staff use existing systems and workflows live.
- Observation can confirm whether reported issues found in surveys and interviews actually appear in practice.

### Interview Questions (Open-Ended)

#### Kelsen

- Support team: "When you look up an order on your phone, what information do you need most quickly, and what frustrates you about current mobile screens? Also, what type of phone and OS do you use?"
- Warehouse team: "How do you currently record and track shipment details, and what challenges do you face when linking that information back to orders?"
- Finance team: "When reviewing payment batches, what checks or comparisons do you perform to confirm totals match the processor?"

#### Fara

- "How can the current ordering process be improved?"
- 

#### Austyn

- "What are the biggest challenges you face in managing your team's daily operations when dispatching orders?"

#### Faye

- "How do you ensure that addresses, emails, and phone numbers are entered in a consistent format? What challenges do you face in maintaining data quality?"

## Observational Requirements

### Kelsen

- Mobile performance test: time how long the Order Enquiry screen takes to load on an older Android phone (target: ~2 seconds).
- Data entry workflow: watch warehouse staff input shipment details (carrier, tracking, weight) and note errors, delays, or unclear fields.
- Report accuracy check: compare Finance's Payment Batch Report totals with processor records to confirm they always match.

### Fara

- Order clerks: how long does it take to find a document? Compare time to sort through a file folder vs. getting documentation ready to process an order.

### Austyn

- How long does it take staff to find a customer's order details?

### Faye

- Observe how dispatch info is recorded (paper, clipboard, spreadsheet).

### Finn

- Analyse how customer support staff interacts with the system — such as responding to an order inquiry or setting up a new customer. Identify what information they access most and where they encounter difficulties.
- Document mining: what format are the addresses of incoming and outgoing orders in?

## Survey Questions

### Kelsen

- Support staff mobile usability: "How easy is it to find the right order information on your phone?" (Very difficult → Very easy)
- Warehouse staff data capture: "How accurate and efficient is the current process for recording shipment details?" (Very inaccurate/slow → Very accurate/efficient)
- Finance report reliability: "How confident are you that the Payment Batch Report provides the correct totals every time?" (Not confident → Completely confident)

### Fara

- "Would your current role benefit from switching tasks from a physical paper environment to a software solution?" (Completely Disagree → Completely Agree)

### Austyn

- "How often do you experience technical issues?" (Never / Rarely / Sometimes / Often / Very Often)

### Faye

- "How often do you have to call or message another department to get tracking info?" (Support team)

### Finn

- "What is your mobile device brand and rough age of the device?" (All staff)

## 9. Requirements Refresh & Categorisation

ID	Stakeholder	Requirement	Category	Sub-Category	Phase
R-01	Support	The system shall display tracking info on the Order Enquiry screen or show 'Not dispatched yet.'	Functional	Process	1
R-02	Support	The system shall restrict Support from viewing full card numbers (only last 4 digits).	Non-Functional	Security	1
R-03	Support	The system shall load the Order Enquiry screen on an older Android phone in under 2 seconds.	Non-Functional	Performance	1
R-04	Warehouse	The system shall allow Warehouse staff to record: carrier, service level, tracking, ship date, and weight linked to orders.	Functional	Process	1
R-05	Warehouse	The system shall produce a Stock Movement report (items in/out).	Functional	Process	1
R-06	Finance	The system shall generate a Payment Batch Report with totals matching the processor.	Functional	Process	1
R-07	Finance	The system shall prevent software releases on Fridays and at month-end.	Non-Functional	Cultural/Policy	1
R-08	Finance	The system shall enforce role-based permissions so Finance can run reports.	Non-Functional	Security	1
R-09	Admin / Ops	The system shall provide daily backups and restore capability for 30 days.	Non-Functional	Operational	1
R-10	Admin / Ops	The system shall maintain a simple audit trail of who changed what and when.	Non-Functional	Security	1
R-11	Admin / Ops	The system shall enforce role-based permissions (Warehouse = dispatch updates; Support = no payment access).	Non-Functional	Security	1
R-12	Data Quality	The system shall capture customer emails and phone numbers on the order form.	Functional	Information	1
R-13	Data Quality	The system shall warn about likely duplicate customers during entry.	Functional	Process	1
R-14	Data Quality	The system shall store delivery addresses in a consistent format.	Functional	Information	1
R-15	Management	The system shall produce a Sales Summary report (orders/revenue over date range).	Functional	Information	1

## 10. Use Cases

### UC-6: Record Shipment Details (Kelsen)

**ID:** UC-6

**Priority:** Medium

**Actor:** Warehouse Staff

#### Description

The Warehouse Staff records shipment details for confirmed customer orders — including carrier, service level, tracking number, ship date, and package weight. This ensures shipping information is linked to the correct order for customer tracking and logistics management.

#### Trigger

Warehouse Staff selects a confirmed order to fulfil and chooses the 'Record Shipment' option.

#### Preconditions

- Order exists in the system with status = Confirmed/Authorised.
- The order has assigned items ready for shipment.
- Warehouse Staff is authenticated and authorised to update shipping information.

#### Normal Course

1. System displays list of confirmed orders pending shipment.
2. Warehouse Staff selects an order to record shipment details.
3. System displays shipment detail form showing order summary (items, buyer info, address).
4. Warehouse Staff enters: Carrier (e.g., UPS, Canada Post, FedEx), Service Level (e.g., Standard, Express, Overnight), Tracking Number, Ship Date, Weight (per parcel or total shipment).
5. System validates all required fields and data formats (tracking number pattern, date format, weight numeric).
6. Warehouse Staff submits the shipment record.
7. System saves shipment details and links them to the order record.
8. System updates the order status to 'Shipped.'
9. System sends shipment confirmation (email + on-screen) to the Buyer with tracking info.

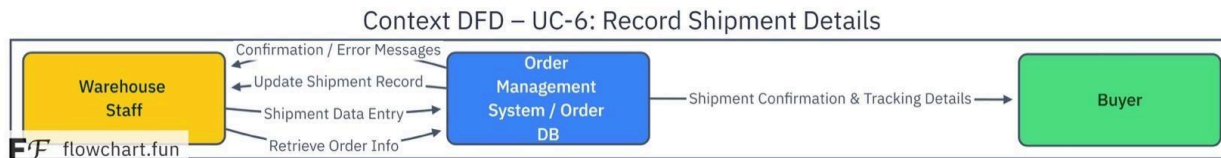
#### Postconditions

- Order status = Shipped.
- Shipment details are stored and linked to the order.
- Buyer can view shipment details and tracking number in their order history.
- Warehouse logs include the shipment record for auditing.

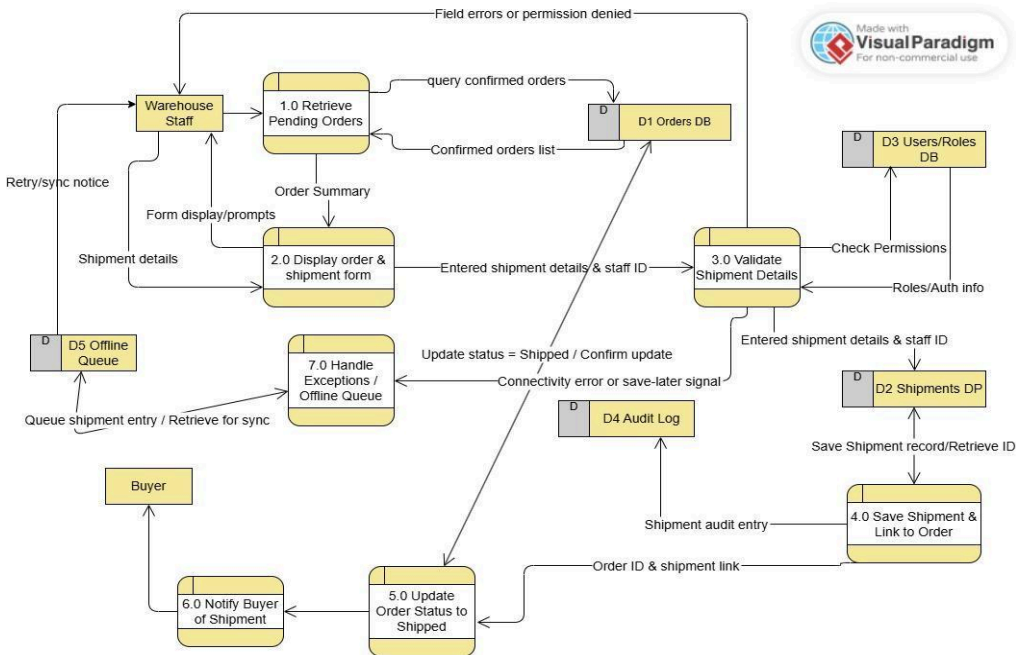
#### Exceptions

- E1: Missing required field → system prompts to complete missing data before saving.
- E2: Invalid tracking number format → system highlights error and requests correction.
- E3: System connectivity issue → system saves entry locally for later synchronisation or notifies staff to retry.
- E4: Unauthorised access → system denies entry and displays 'Insufficient permissions.'

## DFD (version 1)

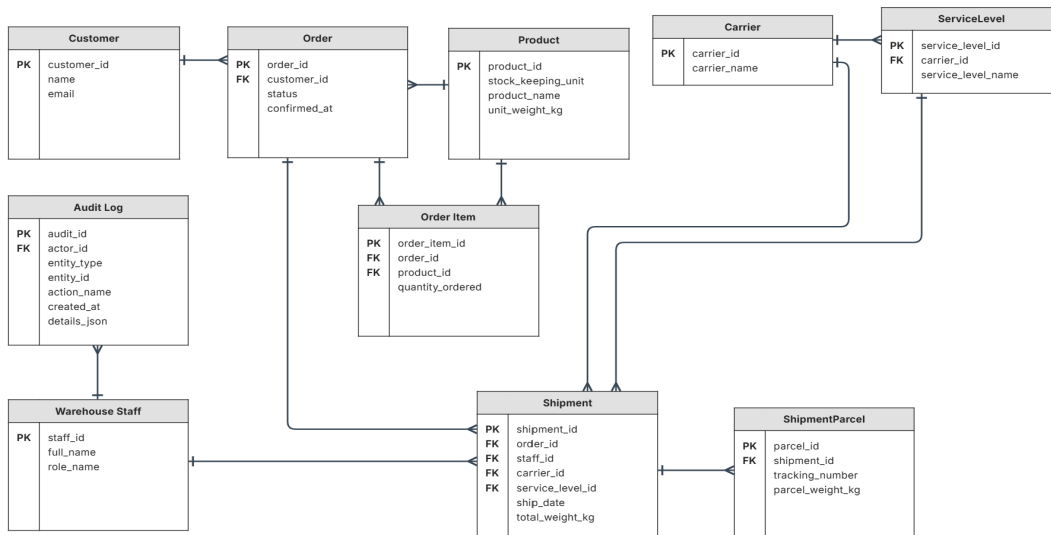


## DFD (version 2)



## ERD

### Warehouse/Order Validation ERD



## UC-4: Export Customer Data (Faye)

**ID:** UC-4

**Priority:** High

**Actor:** Marketing Manager (primary), Marketing Clerk, User

### Description

The Marketing Manager exports a filtered set of customer purchase history and preferences for analysis or reporting purposes. This covers filtering by specific criteria, previewing results, generating an export file (CSV or Excel), and downloading the final dataset.

### Trigger

User clicks the 'Export' button on the customer data dashboard.

### Preconditions

- Marketing Manager is logged into the system.
- Customer purchase history and preference data exist in the database.
- Dashboard is loaded and displaying the export option.

### Normal Course

16. User navigates to the customer data dashboard.
17. Selects filters: date range, product category, customer segment.
18. Clicks the 'Export' button.
19. System prompts the user to choose a file format (CSV or Excel).
20. User selects the desired format.
21. User clicks Confirm.
22. System generates the file based on selected filters.
23. File is downloaded to the user's device.
24. System displays a confirmation message indicating the export was successful.

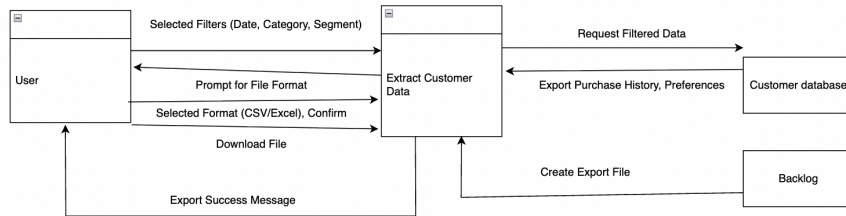
### Postconditions

- The filtered customer data is exported and available on the user's device.
- Dashboard remains unchanged and ready for additional exports.
- Filter bar resets to blank after the download, ready for a new selection.

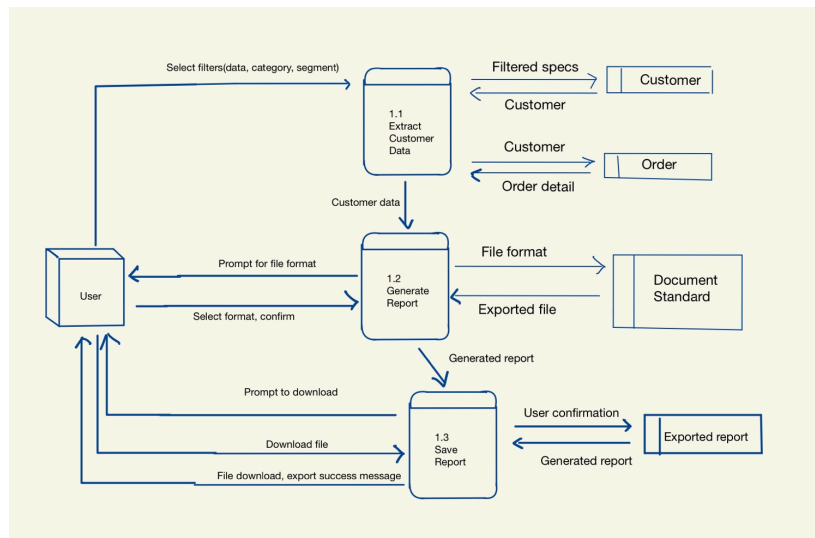
### Exceptions

- E1: System displays a message if filters result in no matching records.
- E2: System shows an error if the file cannot be generated or downloaded.
- E3: System displays an error and prompts the user to check their connection if export cannot be completed due to connectivity issues.

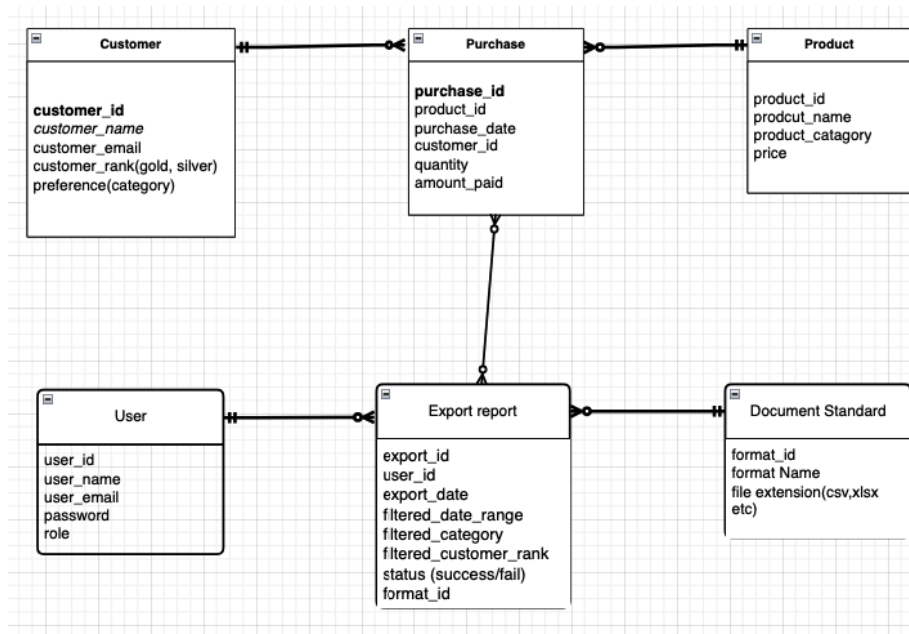
### DFD (version 1)



### DFD (version 2)



### ERD



## UC-10: Generate Sales Summary Report (Austyn)

**ID:** UC-10

**Priority:** High

**Actor:** Manager

### Description

The Manager requests the system to generate a Sales Summary report displaying order counts, total revenue, and average sales per day within a specified date range. This report helps management monitor sales performance and revenue trends.

### Trigger

Manager selects 'Sales Summary' from the Reports menu and inputs a date range.

### Preconditions

- The system contains order and payment data within the selected date range.
- The manager is authenticated with reporting permissions.

### Normal Course

25. System displays the report criteria form (date range, filters).
26. Manager enters the date range and optional filters (e.g., product category, region).
27. System validates inputs.
28. System retrieves all confirmed/authorised orders within the date range.
29. System calculates totals: number of orders, total revenue, and average order value.
30. System generates a tabular and graphical summary (e.g., daily totals, charts).
31. System displays the report on screen.
32. Manager may choose to export the report.

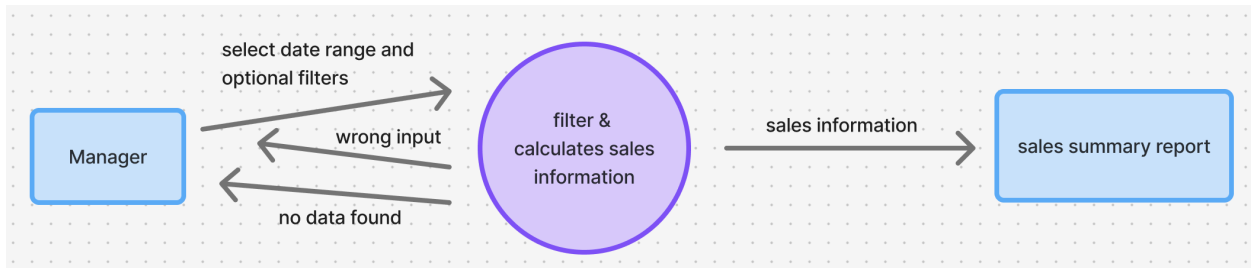
### Postconditions

- Reports are generated and viewable.
- Export file (if chosen) is available for download.

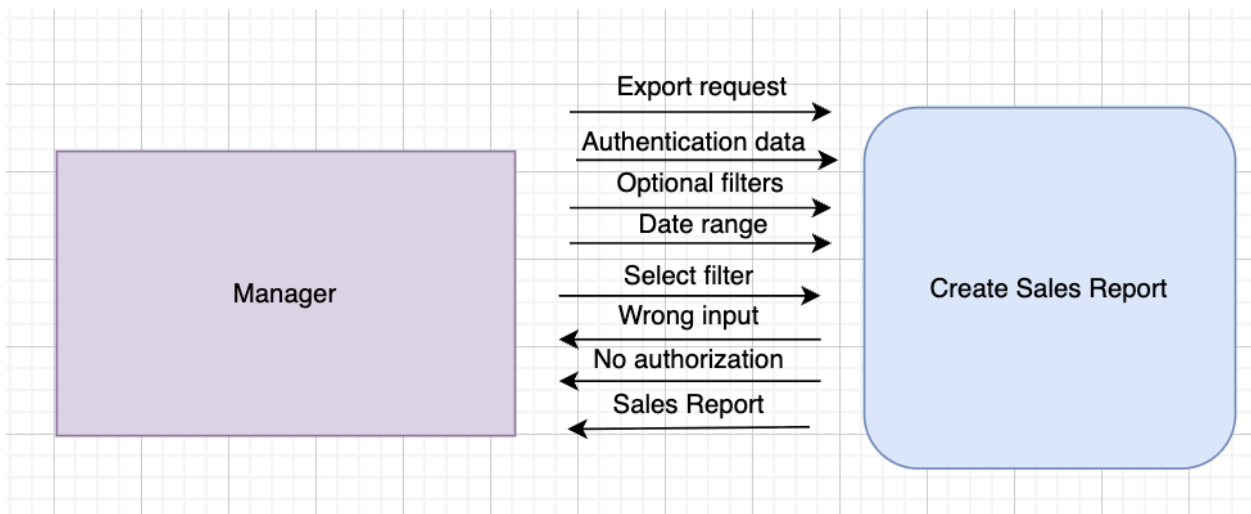
### Exceptions

- E1: Invalid date range (e.g., start > end) → system prompts correction.
- E2: No data found → system displays 'No orders found for the selected period.'
- E3: Database connection error → system shows error message and logs the issue.

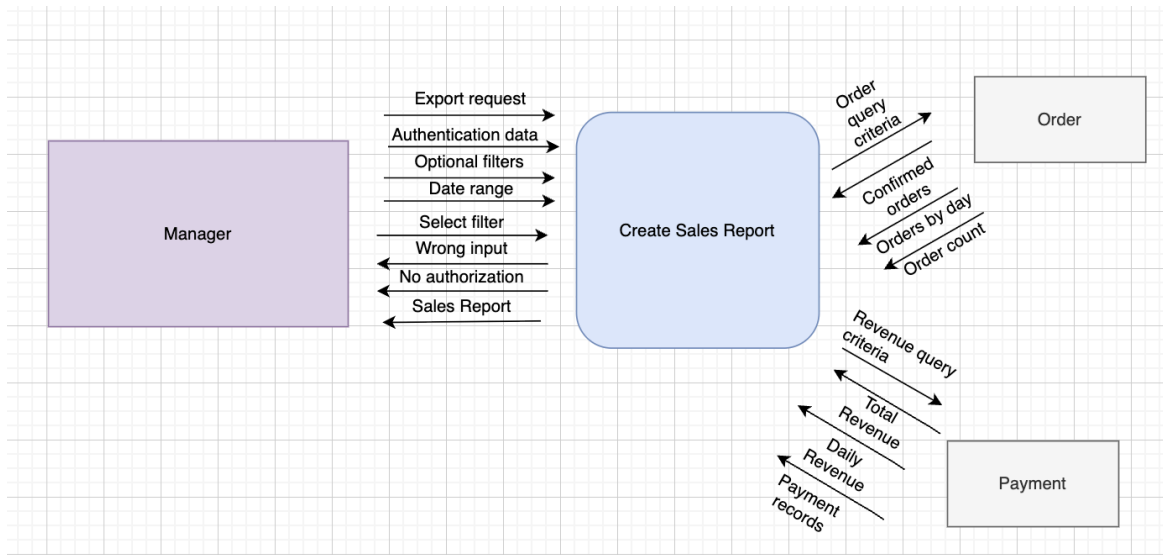
### DFD Level 1 (Version 1)



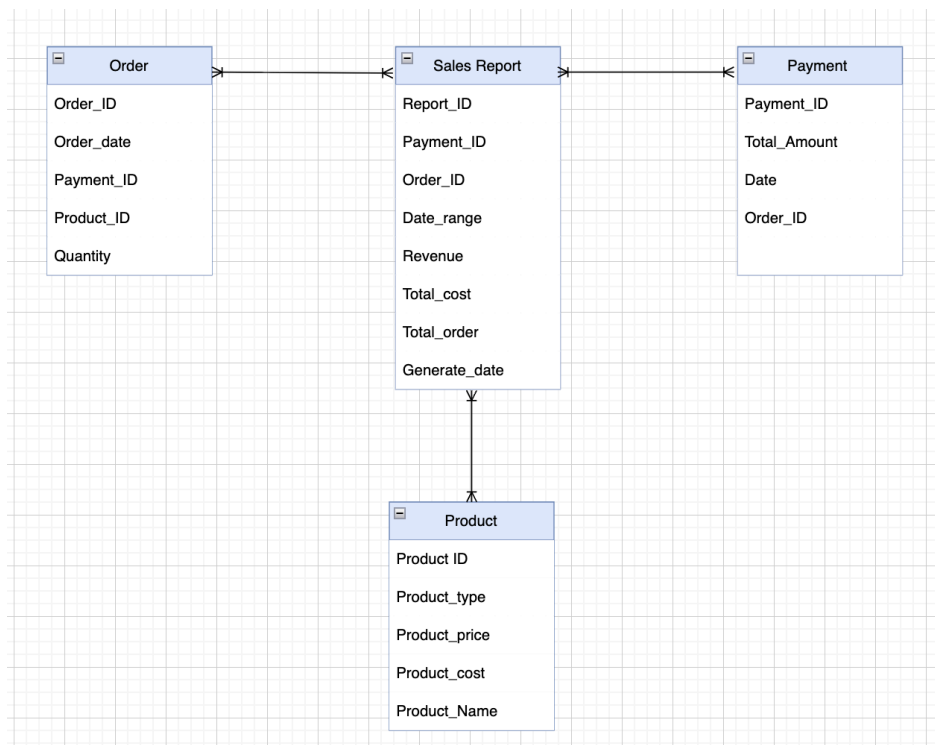
### DFD Level 0 (Version 2)



### DFD Level 1 (Version 2)



### ERD



## UC-14: Store Delivery Addresses in Consistent Format (Finn)

**ID:** UC-14

**Priority:** High

**Actor:** The System

### Description

The user inputs personal delivery information of a customer into the system. The system stores the data in a standardised format. This use case covers address storage and formatting.

### Trigger

User clicks 'Submit' on a delivery address entry field.

### Preconditions

- Address is real and verifiable.
- Address is connected to personal user information.
- User has selected a person to associate the address with.

### Normal Course

33. System locates the CSV/JSON file of associated personal data.
34. System writes the address in the appropriate fields of the file.
35. System saves and closes the file.
36. System provides feedback confirming the address has been saved.

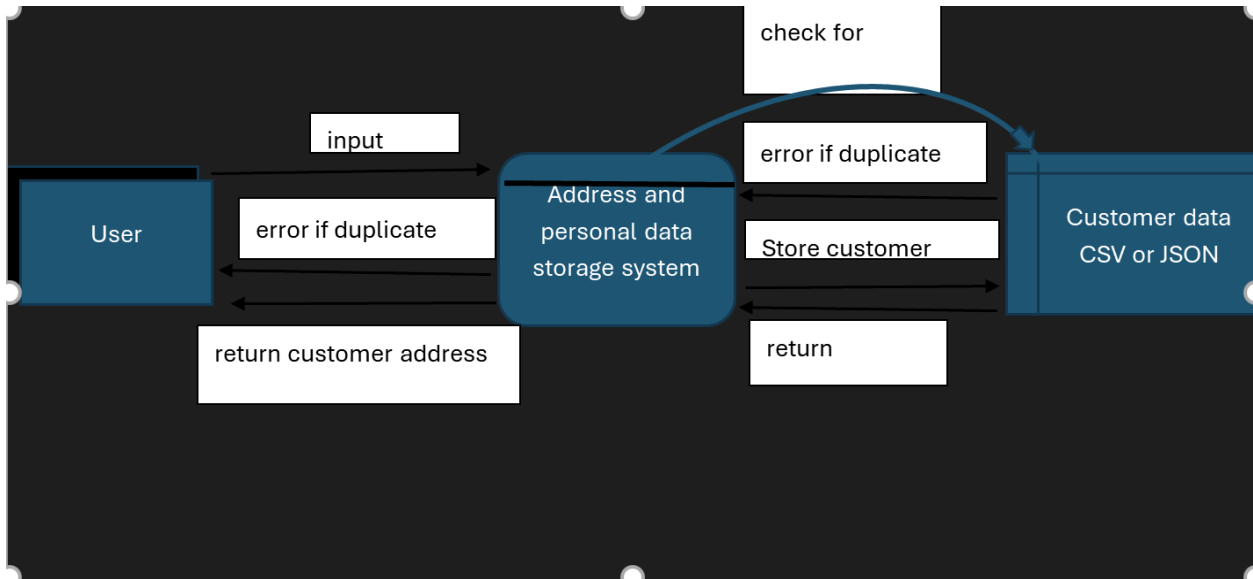
### Postconditions

- The address is visible in the software alongside the rest of the user's data.
- The address is exportable in multiple formats (email, mail, etc.).
- The address is stored in a standardly formatted document.

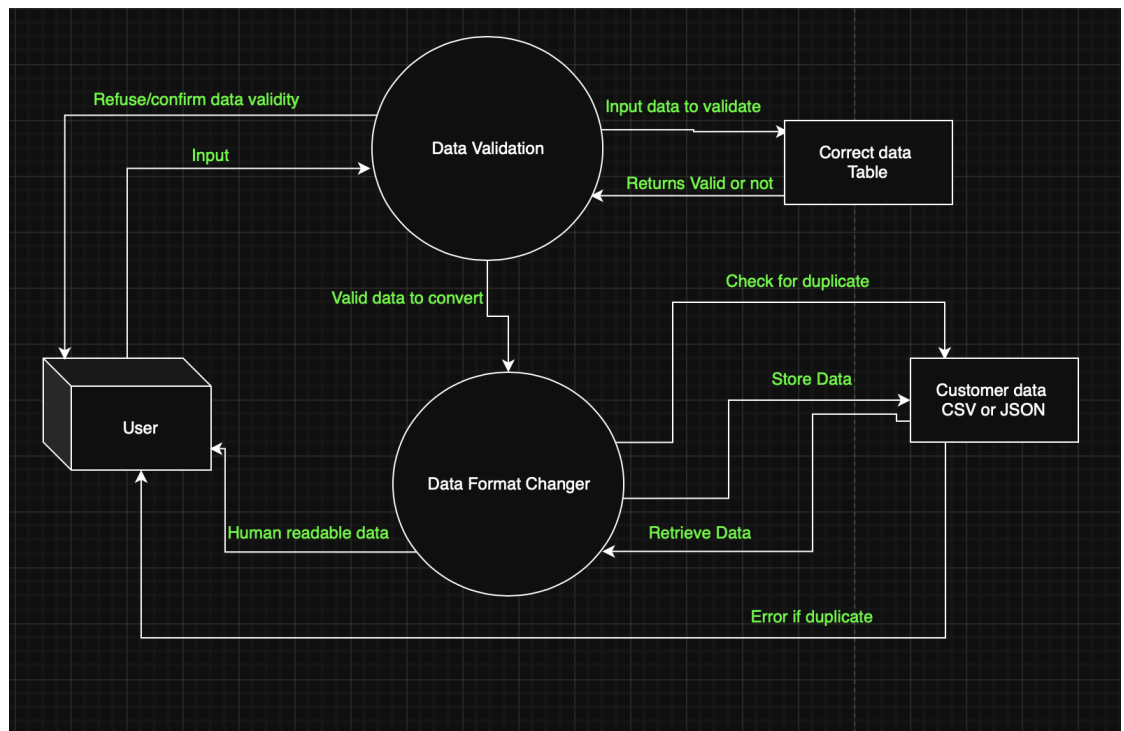
### Exceptions

- E1: No linked user → system shows decline reason; user can retry with a linked address.
- E2: Address invalid → system prompts corrections or suggests a normalised address.
- E3: File storage full → system alerts that the address could not be saved and explains why.
- E4: Gateway error/time-out → system shows a non-technical error and allows safe retry.

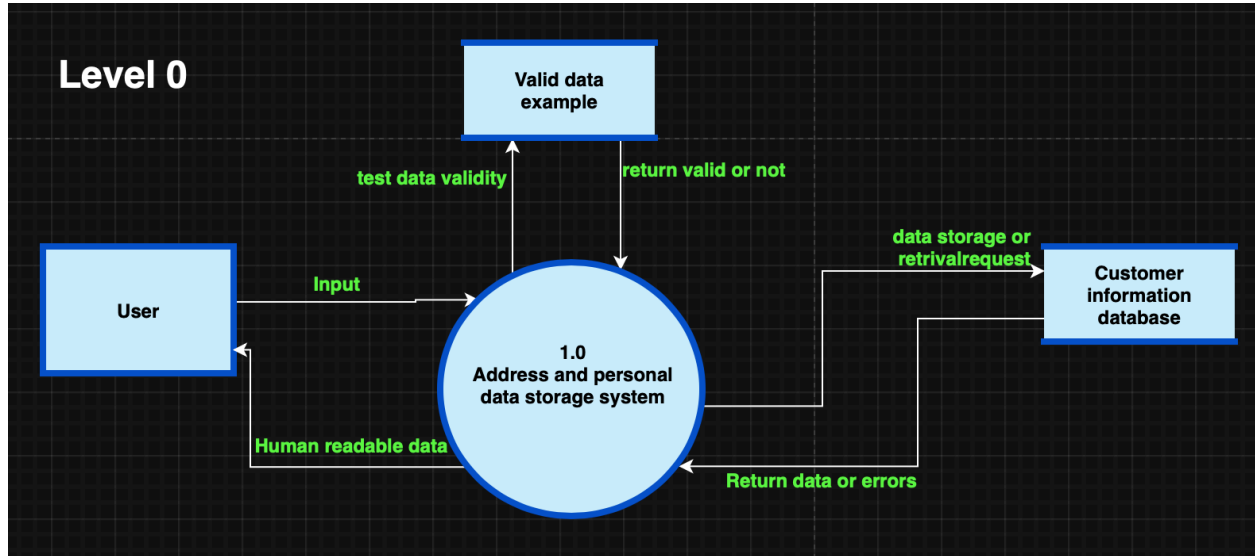
### DFD Level 0 (Version 1)



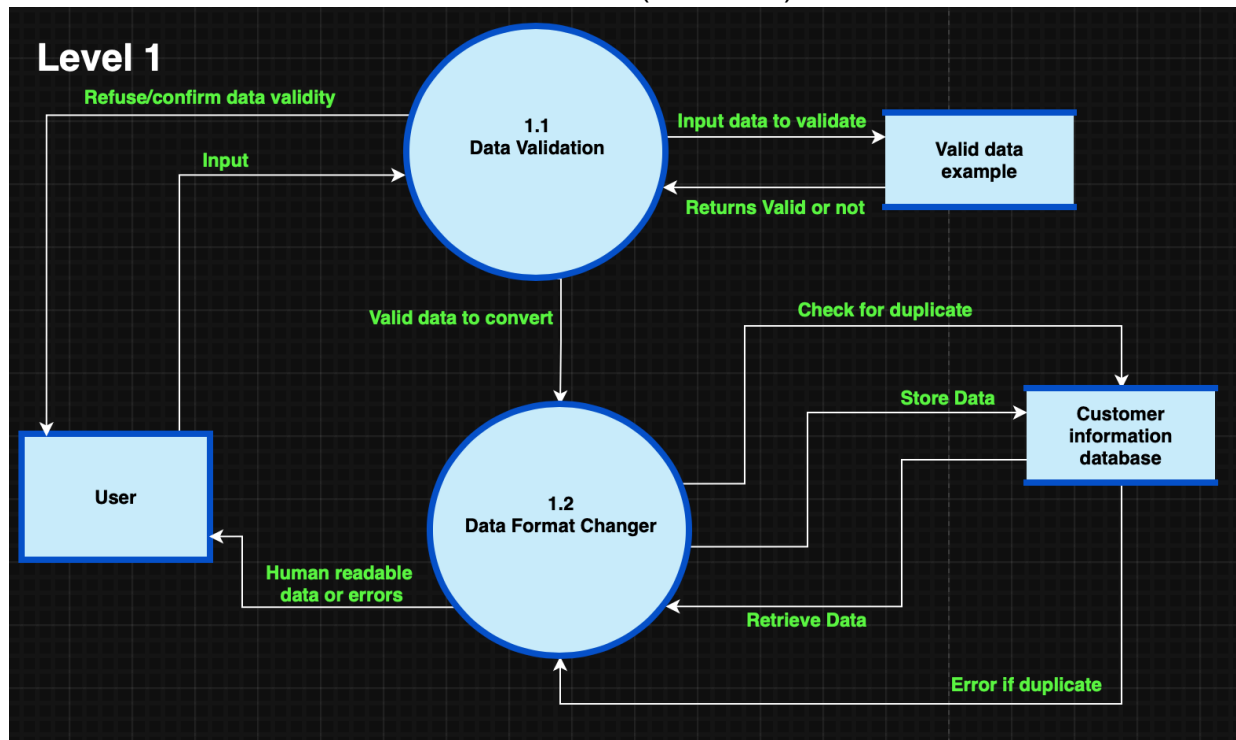
### DFD Level 1 (Version 1)



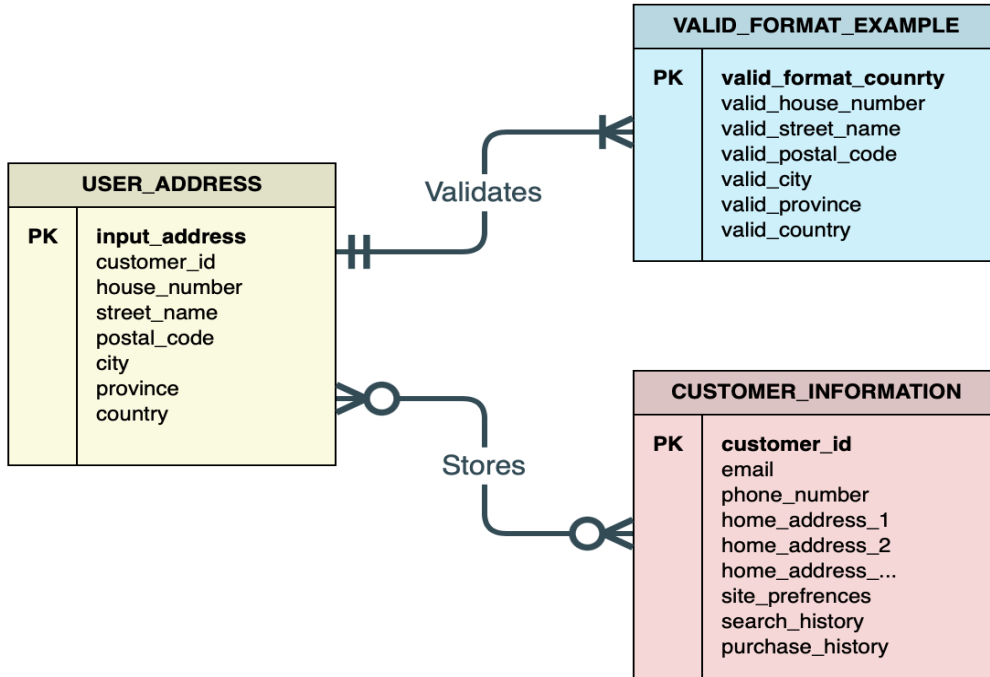
### DFD Level 0 (Version 2)



### DFD Level 1 (Version 2)



# ERD



## R-12: Store Customer Email and Phone Number (Fara)

**ID:** R-12

**Priority:** High

**Actor:** Clerical Staff

### Description

Clerical staff inputs customer name, email, and phone number into the system. This use case covers data input.

### Trigger

Clerical staff saves the data to the system.

### Preconditions

- Clerical staff is logged into the system.
- Customer name, phone number, and email address are known.

### Normal Course

37. Clerical staff has customer name, phone number, and email address available on paper.
38. Clerical staff navigates to the customer data dashboard.
39. Clerical staff clicks 'Enter Customer Information.'
40. Clerical staff records customer name, phone number, and email address in the appropriate fields.
41. Clerical staff clicks 'Save.'
42. System checks if the phone number and email are valid.
43. System prompts the user to confirm the information.
44. Clerical staff clicks 'Confirm' or presses Enter on the keyboard.
45. System saves the information if it has been formatted correctly.
46. System displays a confirmation message on success.

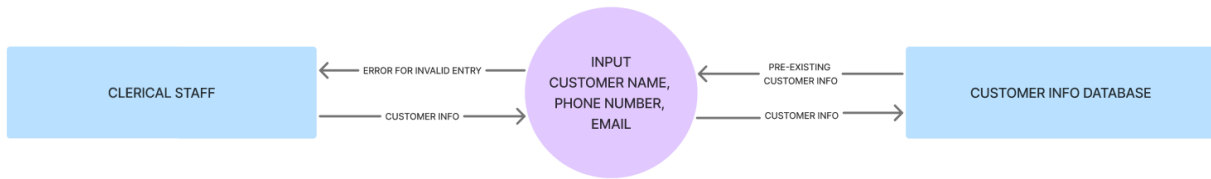
### Postconditions

- Customer data is added to the customer database.
- Clerical staff remains on the customer data dashboard.

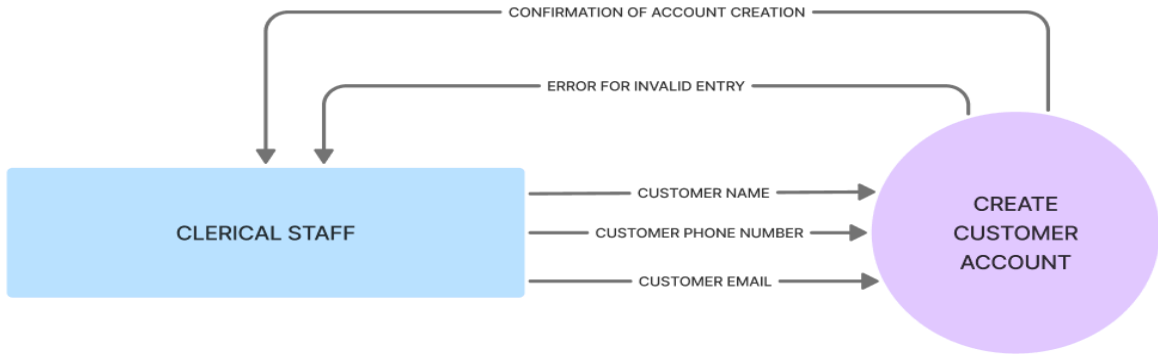
### Exceptions

- Invalid phone number/email → system prompts user to correct the information; asks if user wants to continue with missing information (in case the clerk was supplied with invalid data).
- Phone number/email already in the database → system alerts the user; displays the pre-existing customer information and asks if user wants to merge, duplicate, or discard the new input.

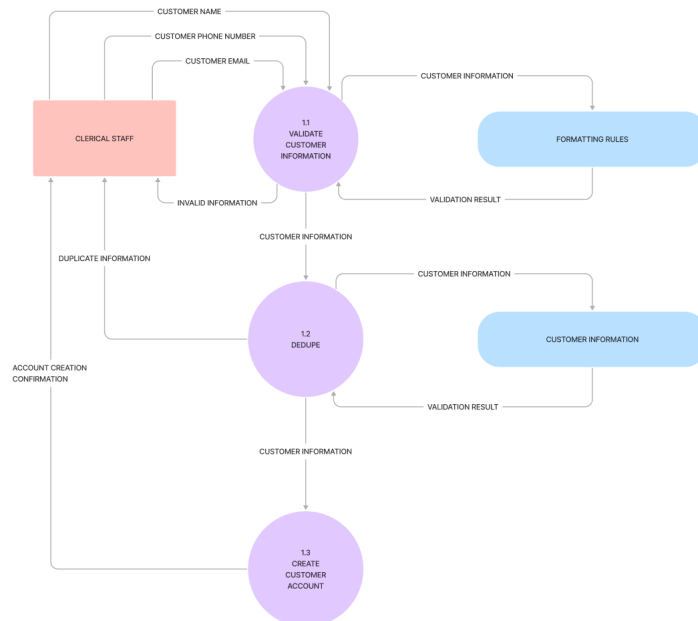
### DFD - level -1: R-12 (Version 1)



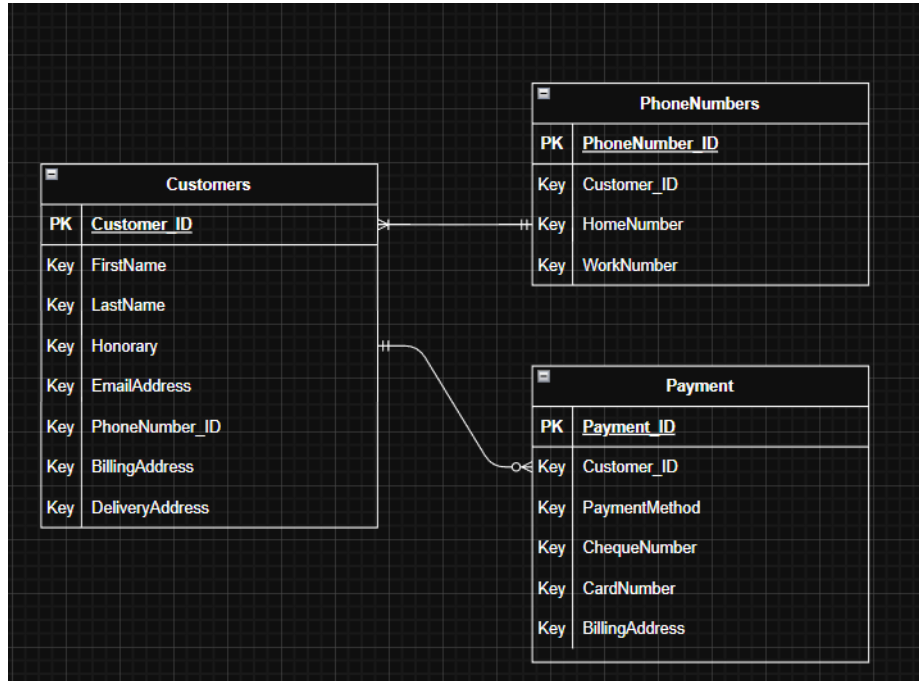
### DFD - level -0: R-12 (Version 2)



### DFD – level -1: R-12 (Version 2)



# ERD



## 11. Decision Matrix

Decision Making Criteria				
#	Criteria	Why it matters	Definition / how you'll judge it	Weight (100% total)
c1	Phase-1 Functional Requirement Fit	Phase 1 must deliver the core capabilities required by daily operations: accurate stock movement tracking, fast order enquiries with tracking information, clean customer data, and correct financial batch totals. If these essential features do not fit natively, the team cannot meet the business need, operational pain points will remain, and Phase-1 will fail to demonstrate value to leadership.	The system must natively support all Phase-1 required functions (order enquiry, dispatch capture, stock movement, payment batch totals, and basic data-quality controls). Fit will be judged by whether each requirement is available out-of-the-box with no major customization required.	25%
c2	Operability & Resiliency	This ensures the system runs reliably day-to-day, even during high workloads or expansion, minimizing downtime and preventing disruptions to orders, dispatch, and customer service.	We will evaluate the vendor's overall operational resilience by looking for safeguards such as daily backups with a 30-day recovery window, automated monitoring and alerts to catch issues early, and a deployment process that avoids releasing updates during busy or sensitive times (e.g., Fridays, month-end), when downtime would have the greatest impact.	15%
c3	Vendor Viability & Roadmap/Scalability	Vendor needs to be able to support store as-is (small scale), and into the future (large, multi country). Must be a stable and trustworthy platform to decrease financial risk. Must be able to support analytics from multiple internal and external sources. Prices must be realistic for a smaller company who may not use all features.	Work for small and large scale businesses. Stable and trustworthy platform. Solid dashboard that works with external sources. Customizable pricing scheme.	15%
c4	Data-Quality Controls	Data quality issues were established as a business need on the System Request	Ability to avoid duplicated user data; linking multiple users to the same address; rules regarding address format and other format sensitive fields	25%
c5	Mobile Performance & UX	Strong mobile performance and a well-designed user experience are essential because both customers and staff increasingly rely on phones and tablets to interact with the system. Fast, intuitive mobile workflows reduce friction, support quicker decision-making, and create a consistent sense of reliability across all touchpoints.	We will assess each vendor on how smoothly their platform performs on mobile devices, how clear and accessible their interfaces are, and how effectively the experience supports key tasks without unnecessary steps or delays.	20%
<b>Total Weight</b>				<b>100%</b>

## Alternative Matrix

Alternative Matrix							
Option 1: Shopify							
#	Criteria	Member 1 (Fara)	Member 2 (Finn)	Member 3 (Kelsen)	Member 4 (Austyn)	Member 5(Faye)	Average Score
C1	Phase-1 Functional Requirement Fit	4	4	4	4	5	1.05
C2	Operatibility & Resiliency	4	4	5	4	4	0.63
C3	Vendor Viability & Roadmap/Scalability	5	4	5	5	5	0.72
C4	Data-Quality Controls	5	3	3	3	4	0.9
C5	Mobile Performance & UX	4	4	5	4	4	0.84
						TOTAL	4.14
Option 2: Microsoft Dynamics 365							
#	Criteria	Member 1 (Fara)	Member 2 (Finn)	Member 3 (Kelsen)	Member 4 (Austyn)	Member 5 (Faye)	Average Score
C1	Phase-1 Functional Requirement Fit	3	3	5	3	4	0.9
C2	Operatibility & Resiliency	4	5	4	4	5	0.66
C3	Vendor Viability & Roadmap/Scalability	4	5	5	5	5	0.72
C4	Data-Quality Controls	5	5	5	5	5	1.25
C5	Mobile Performance & UX	2	3	3.5	2	3	0.54
						TOTAL	4.07
Option 3: Squarespace							
#	Criteria	Member 1 (Fara)	Member 2 (Finn)	Member 3 (Kelsen)	Member 4 (Austyn)	Member 5 (Faye)	Average Score
C1	Phase-1 Functional Requirement Fit	3	4	2	2	3	0.7
C2	Operatibility & Resiliency	5	5	4	5	4	0.69
C3	Vendor Viability & Roadmap/Scalability	3	4	3	3	3	0.48
C4	Data-Quality Controls	2	4	2	2	3	0.65
C5	Mobile Performance & UX	4	4	4	4	4	0.8
						TOTAL	3.32

## Decision-Making Criteria

Criterion	Weight	Description
Meets Phase-1 Requirements	High	Covers all 15 Phase-1 requirements including order enquiry, tracking, payment reporting, and dispatch recording.
Implementation Speed	High	Can be deployed and ready for staff use within the Phase-1 timeline.
Ease of Use	High	Intuitive for staff with varying technical comfort levels.
Mobile Performance	High	Supports order enquiry on older Android devices in under 2 seconds.
Data Quality Controls	Medium	Supports duplicate detection, address standardisation, and audit trails.
Maintenance & Support	Medium	Ongoing effort required for updates, backups, and troubleshooting.
Scalability	Medium	Supports future expansion across South Africa and internationally.
Cost	Medium	Total cost of ownership — development, licensing, and infrastructure.

## Alternative Comparison Matrix

Criterion	Weight	Option 1: Web-Based Thin Client	Option 2: Local Server Thick Client
Meets Phase-1 Requirements	High	✓ Fully supported via cloud SaaS modules	✓ Can be built to spec, but slower to deploy
Implementation Speed	High	✓ Fast — minimal setup, no installation	✗ Slow — workstation installs required
Ease of Use	High	✓ Browser-based, familiar to staff	~ Requires installed client on each PC
Mobile Performance	High	✓ Lightweight web interface, optimised for older devices	✗ Desktop app; limited mobile support
Data Quality Controls	Medium	~ Add-ons may be required	✓ Full custom control
Maintenance & Support	Medium	✓ Vendor-managed backups, updates, patches	✗ Manual patching, local server upkeep
Scalability	Medium	✓ Cloud scales automatically	✗ Requires hardware investment to scale
Cost	Medium	~ Monthly SaaS fees; lower upfront	~ Higher upfront hardware; lower recurring fees

## 12. System Architecture Options

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To	Ivor Merck, Managing Director
From	Group 22, System Analytics
Subject	Architecture Options for Target Enterprises Phase-1 Order Management System
Date	November 21, 2025

### Introduction

The main objective for Phase-1 is to implement a reliable order management system to replace the current manual workflow that struggles with accuracy, speed, and scalability. The goal is to reduce duplicates of customer records, speed up order intake, improve dispatch accuracy, and provide Finance with more stable reporting. This document outlines two possible architecture options, with one recommendation. The architectures analysed are Web-Based Thin Client and Local Server with Thick Client.

### Option 1: Web-Based Thin Client (Cloud-Hosted Application)

#### How It Works

Staff access the system through a web browser on desktop or mobile devices, while all business logic — order enquiries, customer lookup, inventory updates, and payment batch summaries — runs on cloud-hosted application servers. Customer, order, dispatch, and stock-movement data is stored in a secure cloud database managed by the service provider. Optional integrations such as accounting tools, label printing, and analytics dashboards are supported through standard APIs or plug-in modules. System updates, backups, and security patches are handled automatically by the vendor, reducing operational workload for Target Enterprises.

#### Main Components

- Client: Browser (PC / tablet / mobile)
- Application Layer: Cloud-hosted application
- Database: Cloud database managed by the service provider
- Network: Internet connection required
- Integration Layer: APIs or plug-in modules

#### Pros

- Fast Phase-1 delivery — supports order enquiry, tracking, stock movement, and dispatch entry with minimal setup.
- Low maintenance — no on-premises servers; backups, uptime, and updates managed by the cloud provider.
- Strong mobile experience — lightweight, fast web interface suitable for older mobile devices used by support staff.

#### Cons

- Dependency on the internet — network outages directly impact order enquiry and dispatch workflows.

- Limited deep customisation — certain Phase-1 requirements may require add-ons rather than native functionality.
- Basic data-quality controls — advanced features such as address standardisation or duplicate detection likely require additional modules.

## Option 2: Local Server with Thick Client (Desktop Application on LAN)

### How It Works

Software is installed on a central in-house server. Each workstation runs a desktop app connected to the server over Target's internal network. All processing and data remain on-site.

### Main Components

- Client: Installed Windows applications for order capture, dispatch, and finance
- Local Server: Runs business logic and stores data
- LAN: Internal network connecting PCs to the server
- Scheduled Backups: Managed manually or via scripts
- Access Controls: Roles enforced within the application

### Pros

- Works during internet outages — fully internal; good if network reliability improves.
- High control — data stored on-site; no cloud subscription.
- Performance — fast response within the LAN for heavy operations.

### Cons

- Poor fit for current environment — patchy network near Dispatch makes adoption risky.
- Hardware limitations — increased client-side demand raises hardware requirements and costs.
- Higher maintenance — requires local server upkeep, patching, and manual backup checks.
- Limited mobility — harder to support order enquiries on phones.
- Slower rollout — installation required on each workstation; harder to update around Finance's timing constraints.

## Recommendation: Option 1 — Web-Based Thin Client (Cloud-Hosted)

Based on Target's operational realities — shared workstations, patchy local network, reliance on mobile devices for Order Enquiry, and the need for rapid Phase-1 delivery — a cloud-hosted web application is the best fit.

This architecture:

- Aligns with Ivor's request for fast mobile Order Enquiry and lightweight pages.
- Supports Operations' need to capture dispatch details cleanly.
- Protects Finance's month-end workflow by enabling safe, low-impact releases.
- Reduces data-quality risk through shared, real-time validation.
- Provides stronger resilience (daily backups, audit trails, restore options).
- Supports future expansion without major infrastructure investment.

A cloud-based thin-client system offers Target Enterprises the stability, usability, and scalability needed for Phase-1 success and long-term growth.