Volere

Requirements Specification Template

Edition 20—2020

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# 1. The Purpose of the Project

The first section of the template deals with the fundamental reason your client asked you to build a new product. That is, it describes the business problem the client faces and explains how the product is intended to solve the problem.

## 1a. The User Business or Background of the Project Effort

Breadfast is a fast-growing food delivery company that currently suffers from fragmented customer and order data spread across multiple disconnected systems, as stated in the System Vision Document. This causes difficulties for customer support agents providing quick and consistent service, leads to miscommunication between departments due to lack of a shared real-time view of orders, and results in inefficient delivery operations because rider assignments are done manually with limited visibility.

Additionally, senior management struggles to make data-driven decisions due to the lack of integrated reports and analytics, while staff spend excessive time on repetitive manual tasks such as updating records across different systems.

The purpose of this project is to develop a unified CRM system that integrates customer information, order management, delivery and dispatch operations, inventory and supplier management, and sales & analytics into one centralized platform. The system will support operational staff (Customer Support Agents, Delivery Dispatchers, Inventory Managers, and Sales Team) in performing their daily tasks more efficiently, while providing senior management with real-time insights and reports.

## 1b. Goals of the Project

### Goal 1 – Improve Customer Support Operations

### Purpose: To provide customer support agents with a unified customer profile and real-time order information.

### Advantage: This will allow support agents to give faster, more accurate, and consistent responses to customer inquiries without switching between multiple systems.

### Measurement: Measured by a reduction in the number of systems/screens agents need to use per customer case and improved issue resolution times, as reflected in the project’s questionnaire and complaint tracking requirements.

### Goal 2 – Optimize Delivery & Dispatch Operations

### Purpose: To improve delivery efficiency by enabling real-time order tracking, automated rider assignment, and delivery performance monitoring.

### Advantage: This will reduce delivery delays, balance rider workloads more effectively, and improve overall delivery performance.

### Measurement: Measured using delivery metrics such as delivery success rate, average delivery time, and number of delayed/failed deliveries, as already defined in your Delivery & Dispatch user stories and reports.

### Goal 3 – Enhance Management Decision-Making

### Purpose: To provide senior management with integrated, real-time sales and delivery performance dashboards.

### Advantage: This will enable management to make faster and more accurate data-driven decisions regarding operations, sales trends, and resource allocation.

### Measurement: Measured by the availability and usage of real-time analytics dashboards, daily/weekly performance reports, and management’s ability to monitor key performance indicators such as sales performance and delivery performance.

### Goal 4 – Improve Inventory Control

### Purpose: To enable real-time inventory tracking and automated low-stock alerts.

### Advantage: This will help reduce stock shortages, prevent order fulfillment problems, and improve supplier management processes.

### Measurement: Measured by the number of stock-out incidents and the effectiveness of the low-stock alert system, as defined in your Inventory & Supplier Management requirements.

# 2. The Stakeholders

This section describes the stakeholders—the people who have an interest in the product. It is worth your while to spend enough time to accurately determine and describe these people as the penalty for not knowing who they are can be very high.

## 2a. The Client

### Client Identification

### Client: Senior Management of Breadfast

### Role of the Client

### Senior Management is responsible for:

### Approving the CRM project.

### Reviewing high-level analytics and performance dashboards.

### Making final decisions on system acceptance and deployment.

## 2b. Other Stakeholders

### These are taken directly from our Stakeholder Table.

| Stakeholder | Knowledge Needed | Involvement | Influence |
| --- | --- | --- | --- |
| Customer Support Agents | Customer issues, complaint handling workflows, CRM interaction | High | High |
| Sales Team Members | Sales data analysis, customer trends, dashboard needs | Medium | Medium |
| Delivery Dispatchers | Rider assignment processes, delivery workflows | High | High |
| Inventory Managers | Stock handling, supplier management, inventory workflows | High | High |
| Riders | Order delivery, status updates, delivery challenges | Medium | Medium |
| Purchasing Officer | Supplier relations, purchase orders, restocking process | Medium | Medium |
| System Administrators | User roles, permission management, system maintenance | High | High |

### Conflict Resolution

### In case of conflicting requirements:

### Priority is given to Senior Management and Operations Management decisions.

### Conflicts between operational stakeholders (Support, Delivery, Inventory) are resolved through management review.

## 2d. The Hands-On Users of the Product

| User Category | Role | | Subject Knowledge | Other Characteristics |
| --- | --- | --- | --- | --- |
| Customer Support Agent | | Manage customer profiles & complaints | High | Works under high pressure. |
| Delivery Dispatcher | | Assign riders & monitor orders | High | Needs real-time data and alerts |
| Inventory Manager | | Manage stock & suppliers | High | Deals with time-sensitive data |
| Sales Team Member | | Use dashboards & segmentation tools | Medium | Focus on analytics and trends |
| Purchasing Officer | | Handle supplier and PO records | Medium | Administrative and data-focused |
| System Administrator | | Manage users, roles, system configs | High | Responsible for system safety |

## 2e. Personas

## Persona 1 – Customer Support Agent

## A CRM support agent responsible for handling customer complaints, updating customer profiles, and checking order statuses. Needs fast access to data and minimal screen switching.

## Persona 2 – Delivery Dispatcher

## A dispatcher monitoring rider location, assigning orders, and responding to delivery delays. Relies on real-time dashboard data.

## Persona 3 – Inventory Manager

## Responsible for monitoring stock levels, generating restocking requests, and managing supplier information.

## 2f. Priorities Assigned to Users

| User Category | Priority Level | Reason |
| --- | --- | --- |
| Customer Support Agent | Key User | Core daily system user for customer interaction |
| Delivery Dispatcher | Key User | Critical for delivery operations efficiency |
| Inventory Manager | Key User | Prevents stock shortages impacting service |
| Sales Team Member | Secondary User | Uses system mainly for analysis & reporting |
| Purchasing Officer | Secondary User | Uses supplier and inventory modules only |
| Riders | Secondary User | System touchpoint but not main CRM operators |

## 2g. User Participation

| User | Participation Type | Expected Contribution | Estimated Time |
| --- | --- | --- | --- |
| Customer Support Agents | Interviews & User Testing | Workflows, complaint handling, CRM navigation | Medium |
| Delivery Dispatchers | Validate riders | Delivery workflows, rider assignment logic | Medium |
| Inventory Managers | Interviews & Validation | Inventory workflows & supplier processes | Medium |
| Operations Manager | Review Sessions | Approving process flows and acceptance | Low–Medium |
| System Administrator | Technical Consultation | Security, access roles, maintenance | Medium |

## 2h. Maintenance Users and Service Technicians

Maintenance Users:

System Administrators  
Responsible for:

* User management
* System configuration
* Role permissions
* Data backups
* System updates

They require advanced system access and technical documentation to maintain and update the CRM system effectively.

# 3. Constraints

This section describes constraints on the eventual design of the product. Think of a constraint as: no matter how you solve the problem this must be satisfied.

Constraints are global—they are factors that apply to the entire product. The product must be built within the stated constraints. Often you know about the constraints, or they are mandated before the project gets under way. They are probably determined by management and are worth considering carefully—they restrict what you can do and so shape the product. Constraints, like other types of requirements have a description, rationale, and fit criterion, and generally are written in the same format as functional and non-functional requirements.

## 3a. Solution Constraints

* Constraint SC-1: Role-Based Access Control (RBAC)
* Description:  
  The system shall implement Role-Based Access Control (RBAC) for all user roles.
* Rationale:  
  The System Administrator stakeholder is responsible for configuring access levels and managing permissions, and multiple user roles in the system (Support Agent, Dispatcher, Inventory Manager, Sales Team, Admin) require different access levels.
* Fit Criterion:  
  All system users must have access permissions that match their assigned roles, and unauthorized users must be restricted from data editing or viewing.
* Constraint SC-2: Real-Time Data Updates

### Description: The system shall support real-time or near real-time updates for order tracking, delivery status, inventory levels, and dashboard data.

### Rationale: This constraint is derived from the system capabilities and functional requirements which specify real-time order tracking and status updates shared across departments and the use of “real-time analytics dashboards for monitoring sales and delivery performance.

### Fit Criterion: The system must reflect changes in order status, delivery progress, and inventory levels without manual data refreshing by employee.

## 3b. Implementation Environment of the Current System

### To be completed after chapter 7

## 3c. Partner or Collaborative Applications

This section describes the external applications and systems with which the Breadfast CRM must collaborate. These partner applications impose specific design and integration constraints on the product.

#### ****Partner Applications Table****

| Partner Application | Type / Description | Direction & Interface | Critical Data Exchanged | Influence & Notes |
| --- | --- | --- | --- | --- |
| **Breadfast Customer Mobile App** | **In-house Application** The primary customer-facing application for ordering and tracking. | **Bidirectional API** - CRM consumes: New orders, customer messages, ratings. - CRM provides: Order status updates, ETA, agent messages. | - Order Details - Customer Messages - Order Status - Delivery ETA | **High Influence.** Developed internally; API design can be coordinated. |
| **Payment Gateway (Stripe)** | **External Commercial Service** Processes all customer payments and refunds. | **CRM → Gateway (API)** - Initiate payment capture. - Initiate refunds. **Gateway → CRM (Webhook)** - Payment success/failure notification. - Refund confirmation. | - Payment Intent ID - Amount - Status (succeeded, failed, refunded) | **Low Influence.** Must adhere to Stripe's fixed API and webhook specifications. |
| **SMS/Email Gateway (Twilio/SendGrid)** | **External Commercial Service** Sends transactional notifications to customers and riders. | **CRM → Gateway (API)** - Send SMS/Email. - Template and recipient data. | - Customer Phone/Email - Message Template ID - Dynamic Variables (e.g., ETA, Order ID) | **Low Influence.** Must adhere to the provider's API. Template management is internal. |
| **Supplier Portals (Various)** | **External System** Each major supplier's own procurement or inventory system. | **CRM → Portal (API/Email)** - Send Purchase Order (PO). **Portal → CRM (Email/API)** - Send PO confirmation and shipping notice. | - Purchase Order Data - Order Acknowledgement - Shipping Tracking Number | **Very Low Influence.** Interfaces are diverse (EDI, API, email). The CRM may need to support multiple integration methods. Initial version may use manual PDF/email. |
| **Mapping & GPS Service (Google Maps/Mapbox)** | **External Commercial Service** Provides geocoding, routing, and real-time map data. | **CRM → Service (API)** - Geocode customer addresses. - Calculate routes and ETAs. - Display live maps. | - Delivery Addresses - Rider GPS Coordinates - Calculated Routes & Traffic Data | **Low Influence.** Must adhere to the service's API limits and data structures. |

* Notes:

1. Supplier Integration Complexity: The "Supplier Portals" partner presents the most significant integration challenge due to the lack of a standardized interface. The initial implementation (V1.0) will use a semi-automated process where Purchase Orders are generated in the CRM and sent via email as PDF attachments. The goal for V2.0 is to develop API-based integrations with top-tier suppliers.
2. Real-Time Data Flow: The collaboration with the Breadfast Mobile App and SMS Gateway is critical for the real-time customer experience. The CRM must be designed to publish status changes reliably and consume incoming messages with low latency.

## 3d. Off-the-Shelf Software

* Content

### This describes commercial, open source, or any other off-the-shelf software (OTS) that must be used to implement some of the requirements for the product. It could also apply to non-software OTS components such as hardware or any other commercial product that is intended as part of the solution.

* Motivation

### To identify and describe existing commercial, free, open source, or other products to be incorporated into the eventual product. The characteristics, behaviour, and interfaces of the package are design constraints.

* Considerations

### When gathering requirements, you may discover requirements that conflict with the behaviour and characteristics of the OTS software. Keep in mind that the use of OTS software was mandated before the full extent of the requirements became known. In light of your discoveries, you must consider whether the OTS product is a viable choice. If the use of the OTS software is not negotiable, then the conflicting requirements must be discarded.

### Note that your strategy for discovering requirements is affected by the decision to use OTS software. In this situation you investigate the work context in parallel with making comparisons with the capabilities of the OTS product. Depending on the comprehensibility of the OTS software, you might be able to discover the matches or mismatches without having to write each of the business requirements in atomic detail. The mismatches are the requirements that you will need to specify so that you can decide whether to satisfy them by either modifying the OTS software or satisfying the requirement in another way or modifying the business requirements.

### Given the spate of lawsuits in the software arena, you should consider whether any legal implications might arise from your use of OTS. You can cover this in section 17. Legal Requirements.

* Form

### Models or written documentation that specifies the functional and non-functional requirements that can be implemented using this OTS software product. If the OTS product has a well structured requirements specification and systems architecture model, then that provides you with the basis for identifying which of your requirements can be satisfied by the product. If the product’s documentation is not traceable and well organized, then you will need to do more detailed work on your own requirements until you find a level at which you can map your requirements to the OTS product.

### Another form is a person or people who are experts in the OTS product and can answer your questions without you having to puzzle through cryptic or marketing-oriented documents.

## 3e. Anticipated Workplace Environment

* Office environments (Customer Support, Sales Team, Management).
* Operations/Dispatch environments (Delivery Dispatchers).
* Warehouse/Inventory environments (Inventory Managers).

1. Noise Environment

* The product will be used in a noisy environment where audible alerts may not be heard clearly.
* Visual notifications must be prioritized over sound notifications.

3. Workspace Availability

* Some users may have limited desk space.
* The system interface should avoid requiring multiple screens to perform one task.

4. Mobility During Work

* Some users may move between locations while using the system.
* The system should allow quick task switching without losing data.

5. Shared Workstations

* Multiple users may use the same devices in shifts.
* The system must enforce user login/logout properly to prevent unauthorized access.

6. Screen Size Limitation

* Some users may use smaller screens.
* The interface must adapt to different screen sizes without losing critical information.

3f. Schedule Constraints

## This section outlines the critical deadlines and time-based limitations that directly impact the scope and prioritization of requirements for the Breadfast CRM system.

## Primary Schedule Constraints

## Constraint SC-S1: Q4 Peak Season Readiness

## Deadline: October 1, 2025

## **Reason:** The Q4 period (October-December) represents Breadfast's peak sales season, characterized by a significant increase in order volume, customer inquiries, and delivery complexity. The new CRM must be fully operational and stable *before* this surge begins to ensure service quality and manage operational load.

## Effect of Not Meeting Deadline:

## Customer support response times would degrade significantly with the legacy systems, leading to a poor customer experience and potential reputational damage.

## Inefficient dispatch and inventory management during peak season could lead to delayed orders, stock-outs, and increased operational costs.

## The marketing and sales teams would be unable to leverage the new segmentation and analytics features for critical Q4 promotional campaigns.

## Constraint SC-S2: Phased Delivery for Core Operations

## Deadline 1 (Milestone 1): July 15, 2025

## **Reason:** The **Customer Management** and **Order Management** subsystems represent the core of daily operations for the support and dispatch teams. A stable version of these modules must be delivered for User Acceptance Testing (UAT) and training to allow for a smooth transition from legacy systems.

## Effect of Not Meeting Milestone 1:

## End-user training cannot begin on schedule, risking poor adoption and operational errors at launch.

## Insufficient time for UAT would force a choice between delaying the final launch or deploying a potentially unstable system.

## Deadline 2 (Milestone 2): August 30, 2025

## **Reason:** The **Inventory & Supplier Management** and **Delivery & Dispatch Management** subsystems must be delivered for UAT. This allows the inventory and logistics teams to be trained and integrated into the new workflow before the final go-live.

## Effect of Not Meeting Milestone 2:

## The operational "hand-off" between order management and fulfillment teams would remain disjointed, negating a key benefit of the integrated CRM.

## The system would launch without full departmental buy-in, creating resistance and workarounds.

## Impact on Requirements & Prioritization

## Given the immovable October 1st deadline, the following prioritization strategy will be enforced:

## **Version 1.0 (October 1 Launch)** will include all functional requirements deemed **"Critical"** and **"High"** priority for daily operations, as defined in the requirements backlog. These directly support the core user stories for customer support, order tracking, delivery dispatch, and basic inventory management.

## Requirements tagged as **"Medium"** or **"Low"** priority, along with all items currently in the **Waiting Room**, will be explicitly deferred to subsequent releases (e.g., Version 1.5, 2.0) to ensure the timely and stable delivery of the core product.

## The **Analytics & Reporting** subsystem will be included in V1.0 but with a focus on pre-defined, essential dashboards. Advanced custom reporting and deep analytical features will be scheduled for post-launch iterations.

## 3g. Budget Constraints

* Content  
  This section specifies the financial limits and available resources allocated to the Breadfast CRM project. It establishes the development, integration, and deployment budget as approved by senior management.
* Budget Statement  
  Breadfast has allocated a maximum budget of 4,000,000 EGP for the design, development, testing, deployment, and initial operational training of the new CRM system.  
  This budget includes:

## Software development and engineering resources

## Third-party services (e.g., payment gateway, SMS/Email gateway, map services)

## Required cloud infrastructure (servers, databases, monitoring tools)

## Integration costs with existing Breadfast systems

## User training and change management

## Contingency allocation (approx. 10–15%)

* Motivation  
  To ensure that all functional and non-functional requirements are achievable within realistic financial boundaries. The budget provides a clear limit for scope, prevents over-engineering, and ensures Breadfast is genuinely committed to the investment.
* Considerations  
  The CRM system integrates multiple critical workflows—Customer Management, Order Management, Delivery & Dispatch, Inventory Management, and Analytics—which require significant engineering effort and robust backend architecture.
* Key constraints driven by the budget include:

## Advanced analytics, full automation, and extensive integrations may be phased into **Version 2.0** if they exceed cost limits.

## Real-time synchronization across departments requires reliable cloud hosting, which consumes a notable portion of the budget.

## API-based integrations with supplier portals are **deferred** unless top-tier suppliers justify the ROI.

## Expensive customization of external APIs (e.g., Stripe, Twilio) is minimized; the system adheres to standard integration flows.

* Based on current estimates and scope of work, the allocated budget is considered realistic for delivering Version 1.0 before peak season (Q4 2025). If costs exceed projections due to integration complexity or expanded requirements, management must re-evaluate priorities or increase funding.
* If the project is not realistically achievable within this budget, it may indicate that the client is not fully committed, or the product expectations are misaligned with available resources. In that case, the project scope must be reduced or additional funding secured.
* Form  
  A formal written statement of the approved CRM project budget:  
  Budget Amount: 4,000,000 EGP  
  Funding Source: Breadfast Senior Management – Technology & Operations Improvement Fund (FY 2025)

## 3h. Enterprise Constraints

### Content This section lists the constraints that arise from Breadfast’s internal policies, organizational rules, and strategic decisions. These constraints are not directly related to the functional goals of the CRM system but must still be followed for compliance, security, and operational consistency across the company.

### Enterprise Constraint EC-1: Breadfast Technology Stack Requirement

### Description: The CRM system shall be developed using Breadfast’s approved technology stack, which includes web-based architecture, cloud hosting (AWS), and modern JavaScript frameworks (React, Node.js).

### Rationale: Breadfast’s IT department enforces a standard tech stack for maintainability, scalability, and compatibility with existing microservices.

### Fit Criterion: All implemented modules must run successfully on AWS and use the approved backend and frontend technologies.

### Enterprise Constraint EC-2: Mandatory Integration with Existing Breadfast Platforms

### Description: The CRM must integrate with Breadfast’s existing systems, including:

### Breadfast Customer Mobile App

### Payment services (Stripe)

### SMS/Email notification providers (Twilio/SendGrid)

### Internal order and delivery microservices

### Rationale: Breadfast has strategic commitments and long-term contracts with these service providers.

### Fit Criterion: All integrations must pass end-to-end testing with existing production environments before deployment.

### Enterprise Constraint EC-3: Compliance with Breadfast Security & Privacy Policy

### Description: The CRM must comply with internal data protection rules, including encryption of sensitive customer data, RBAC enforcement, and strict audit logging.

### Rationale: Breadfast follows internal security standards for data handling and customer privacy.

### Fit Criterion: IT Security must certify that all sensitive fields (e.g., phone, email, payment info) follow encryption and access standards.

### Enterprise Constraint EC-4: Use of Breadfast Single Sign-On (SSO)

### Description: All employees must access the CRM using the existing Breadfast SSO system.

### Rationale: Breadfast requires centralized authentication for operational control and security compliance.

### Fit Criterion: No user should be able to access the CRM without authenticating through the SSO service.

### Enterprise Constraint EC-5: Operational Hours and System Availability Policy

### Description: The CRM must support 24/7 availability, as Breadfast’s operations run continuously across support, delivery, and fulfillment teams.

### Rationale: Downtime directly affects order handling, delivery assignment, and customer support.

### Fit Criterion: System uptime must be ≥ 99.5% monthly as monitored by Breadfast’s infrastructure team.

### Enterprise Constraint EC-6: Data Residency Requirement

### Description: All customer and order data must be stored in cloud regions approved by Breadfast and aligned with Egyptian data-handling policies.

### Rationale: Breadfast prioritizes data residency compliance for operational and legal reasons.

### Fit Criterion: All databases must be hosted in AWS regions approved by management (e.g., Bahrain region).

### Enterprise Constraint EC-7: Organizational Role Visibility Rules

### Description: Certain analytics and business performance dashboards must be accessible only to senior management.

### Rationale: Corporate policy restricts financial and operational insights to executive roles.

### Fit Criterion: Access control testing must confirm restricted visibility for non-management users.

### Enterprise Constraint EC-8: Approved Procurement & Vendor Restrictions

### Description: Only Breadfast-approved vendors may be used for SMS, email, and mapping APIs. New vendors cannot be added without executive approval.

### Rationale: Breadfast maintains long-term contracts and compliance agreements with existing providers.

### Fit Criterion: Integration testing must show CRM communication features use only approved vendor APIs.

# 4. Naming Conventions and Terminology

## 4a. Glossary of All Terms, Including Acronyms, Used by Stakeholders Involved in the Project

A

API (Application Programming Interface)  
A set of rules that allows Breadfast systems to communicate with each other or with third-party services (such as Stripe or Twilio).

App (Breadfast App)  
The mobile application used by customers to place orders, track deliveries, pay, and manage their profiles.

Agent ID  
A unique identifier assigned to each Customer Support Representative using the CRM.

Auto-Assignment  
A CRM automation feature that routes tickets or tasks to agents based on rules such as workload, issue type, or priority.

B

Breadfast Operations Team  
Internal department responsible for warehouse management, delivery assignment, order preparation, and restocking.

Business Rules  
Policies that govern how orders, deliveries, customer interactions, refunds, and escalations must be handled.

C

CSR (Customer Support Representative)  
Breadfast employee responsible for handling customer issues, complaints, and inquiries via the CRM.

CRM (Customer Relationship Management System)  
The system being developed to manage customer interactions, orders, delivery issues, refunds, support tickets, and analytics.

Customer Profile  
A record containing customer information such as name, phone number, email, address, past orders, and activity logs.

Customer Ticket  
A documented issue or request submitted by a customer and handled inside the CRM until resolution.

Customer Tier  
A classification of customers (e.g., “Regular,” “Premium,” “High-Value”) based on Breadfast analytics.

D

Delivery Agent / Rider  
A Breadfast courier responsible for delivering orders to customers.

Delivery Slot  
Time window chosen by the customer for order delivery.

Dispatch System  
Internal system that assigns delivery tasks to riders based on location and capacity.

Dashboard  
An interface inside the CRM that shows key metrics such as ticket volume, rider performance, or order trends.

Data Dictionary  
A detailed list of data elements used in the CRM (pulled later in Section 7 of the SRS).

Dependent Subsystem  
Any subsystem that relies on inputs or outputs from the CRM (e.g., Delivery APIs, Inventory APIs).

E

ETA (Estimated Time of Arrival)  
The predicted arrival time of a delivery, used in both the app and CRM.

Escalation Level  
The degree of urgency of a ticket (Level 1 = normal CSR, Level 2 = senior agent, Level 3 = manager).

F

Functional Requirement (FR)  
A requirement describing a system feature or behavior.

H

Handling Time  
The amount of time an agent takes to resolve a ticket or support request.

High-Risk Customer Profile  
A flagged customer who has repeated complaints, refunds, or suspicious patterns.

I

Inventory System  
Breadfast’s system that tracks stock levels, warehouse availability, and restocking needs.

Issue Category  
A label assigned to customer problems (e.g., “Late Delivery,” “Missing Item,” “Payment Failure”).

Interaction History  
Complete record of customer communications across channels (call, app, chat, SMS).

K

KPI (Key Performance Indicator)  
Metrics used to evaluate performance of teams, delivery speed, ticket resolution time, etc.

KYC (Know Your Customer)  
Identity verification steps used when customers apply for financial services (only relevant if integrated with Breadfast’s fintech offerings).

L

Live Order  
An active order that is currently being prepared, dispatched, or out for delivery.

M

Microservice  
A small independent service within Breadfast’s architecture (e.g., payment, delivery assignment, warehouse).

Middleware  
Software that connects different Breadfast services and ensures reliable communication.

Manual Override  
A CSR or manager forcing a change in system workflow (e.g., manually changing rider assignment).

Message Queue  
System used to manage asynchronous communication between CRM subsystems.

N

NPS (Net Promoter Score)  
A customer satisfaction metric used to measure customer loyalty and overall experience.

Notification Engine  
CRM component that sends automated SMS, email, or push notifications.

O

OMS (Order Management System)  
Breadfast’s backend system responsible for receiving, processing, routing, and fulfilling customer orders.

Order History  
A list of a customer’s previous orders, accessible by both the app and CRM.

Order Status  
A state label indicating the stage of an order (e.g., “Preparing,” “On the Way,” “Delivered”).

P

PO (Purchase Order)  
Document used internally for restocking and supply management.

Payment Gateway  
A third-party service (e.g., Stripe) used to process customer payments securely.

Pending Customer Response

State where the system waits for the customer to reply before continuing.

R

RBAC (Role-Based Access Control)  
Breadfast’s internal rule system that controls which employees can access which parts of the CRM.

Refund Request  
A customer request for compensation due to incorrect orders, missing items, or delivery issues.

Region / Zone  
Geographical delivery areas used for assigning riders and calculating ETA.

S

SLA (Service Level Agreement)  
Time limits for resolving customer tickets or completing deliveries (e.g., “Tickets must be addressed within 10 minutes”).

SMS Gateway  
Third-party service used for sending SMS notifications (e.g., Twilio).

SSO (Single Sign-On)  
Breadfast’s authentication method allowing employees to log in using one centralized system.

Support Workflow  
The step-by-step process followed by CSRs when handling customer issues.

Segmentation  
The process of grouping customers into distinct categories based on shared attributes or behaviors (e.g., total spend, purchase frequency, product preferences) to enable targeted marketing, personalized offers, and operational prioritization.

Customer Segmentation  
A specific segmentation applied to customers. Example segments: *High-Value* (total spend > X), *Frequent Buyers* (orders/month > Y), *At-Risk* (no orders in Z days). Segments can be static (manual assignment) or dynamic (automatically updated based on rules).

Segment Rule  
A defined condition or set of conditions used by the system to determine membership of a customer in a segment (e.g., TotalSpend > 500 AND OrdersLast90Days >= 3).

Segment Membership  
The record indicating that a particular customer belongs to one or more segments. Membership may carry metadata (date added, source rule, TTL).

T

Ticket Priority  
Whether the ticket is Low, Medium, High, or Critical based on severity.

Tracking Link  
A URL sent to customers to view the live progress of their order.

U

UI (User Interface)  
The visual screens and elements used by employees when interacting with the CRM.

User Role  
A defined group specifying permissions (e.g., CSR, Supervisor, Manager).

W

Warehouse  
Breadfast’s facility where products are stored, picked, packed, and shipped.

Workflow Automation  
CRM feature that automatically assigns tasks, sends notifications, or updates ticket statuses.

Z

Zone Assignment  
The process of assigning riders to delivery areas or regions.

# 5. Relevant Facts and Assumptions

Relevant facts are external factors that have an effect on the product but are not covered by other sections in the requirements template. They are not necessarily translated into requirements but might be. Relevant facts alert the developers to conditions and factors that have a bearing on the requirements.

## 5a. Relevant Facts

* Content

### Factors that have an effect on the product, but are not mandated requirements or constraints. Facts provide the reader of the specification with more background for understanding the business problem.

* Motivation

### Relevant facts provide background information to the specification readers, and might contribute to requirements. They will have an effect on the eventual design of the product.

* Examples

One ton of de-icing material will treat three miles of single-lane roadway.

The existing application is 10,000 lines of C code.

## 5b. Business Rules

* Content

### These are business rules that might have an impact on the work/business/domain that is the source of the requirements. Relevant business rules will be the trigger for requirements.

* Motivation

### Business rules are mentioned at all stages of the requirements discovery process. It is often difficult to immediately ascertain whether a business rule is or is not relevant to the project that you are doing. This section provides a place to capture the business rules and, as understanding of the work increases, to revisit them and use them as triggers to discover relevant requirements.

* Examples

The maximum length of a truck driver’s shift is 5 hours.

The engineers maintain the weather stations once a week.

* Form

### A written statement describing the business rule, the reason for the rule, the authority for the rule.

### At the start of a new project have a look to see if there are some relevant business rules that have already been defined. This sets you on the road to requirements reuse. When your project discovers a new or changed business rule add this to the *Business Rule Book* for your enterprise. The business rule book then becomes input to and is updated by every project.

### You might include business process models (there are many different forms of these) to illustrate how the business rule affects the organization.

## 5c. Assumptions

* Content

### A list of the assumptions that the developers are making. These assumptions might be about the intended operational environment, but can be about anything that has an effect on the product. As part of managing expectations, assumptions also contain statements about what the product will *not* do.

* Motivation

### To make people declare the assumptions that they are making. Also, to make everyone on the project aware of assumptions that have already been made.

* Examples

### Assumptions about new laws or political decisions.

### Assumptions about what your developers expect to be ready in time for them to use—for example, other parts of your products, the completion of other projects, software tools, or software components.

### Assumptions about the technological environment in which the product will operate. These assumptions should highlight areas of expected compatibility.

### The software components that will be available to the developers.

### Other products being developed at the same time as this one.

### The availability and capability of bought-in components.

### Dependencies on computer systems or people external to this project.

### The requirements that will specifically *not* be carried out by the product.

### Some specific examples of assumptions from the IceBreaker project are:

### Roads that have been treated will not need treating for at least two hours.

### Road treatment stops at county boundaries.

### Road Engineering’s Appian system will be available for integration testing before November.

### The treatment trucks being built will be capable of operating at up to 40 mph. They will have a material capacity of two tons.

### The Bureau’s forecasts will be transmitted according to its specification 1003-7 issued by its engineering department.

* Considerations

### We often make unconscious assumptions. It is necessary to talk to the members of the project team to discover any unconscious assumptions that they have made. Ask stakeholders (both technical and business-related) questions such as these:

● What software tools are you expecting to be available?

● Will there be any new software products?

● Are you expecting to use a current product in a new way?

● Are there any business changes you are assuming we will be able to deal with?

### It is important to state these assumptions up front. You might also consider the probability of whether the assumption is correct and, where relevant, a list of alternatives if something that is assumed does not happen.

### The assumptions are intended to be transient. That is, they should all be cleared by the time the specification is released—the assumption should have become either a requirement or a constraint. For example, if the assumption related to the capability of a product that is intended to be a partner product to yours, then the capability should have been proven satisfactory, and it becomes a constraint to use it. Conversely, if the bought-in product is not suitable, then it becomes a requirement for the project team to construct the needed capability.

* Form

### A written statement describing the assumption along with the effect on the project if the assumption is false. Depending on the complexity of the assumption, it might be necessary to include references to other documents or people

### Understanding of assumptions can be explored and shared by using cause and effect diagrams such as Peter Senge’s dynamics models.

# 6. The Scope of the Work

The scope of the work determines the boundaries of the business area to be studied and outlines how it fits into its environment. Once you understand the work and its constraints, you can establish the scope of the product see Section 8 of the template.

## 6a. The Current Situation

* Content

### This is an analysis of the existing business processes, including the manual and automated processes that might be replaced or changed by the new product. In terms of the Volere Brown Cow model you refer to this view as the “How Now” view. Business analysts might already have done this investigation as part of the business case analysis for the project. This is where it might be appropriate to build some Business process models. These are models of the processes that the business uses to carry out the work of the organization. The models include roles, individuals, departments, technology and procedures. They illustrate the workflow and the dependencies between the components of the process.

* Motivation

### If your project intends to make changes to an existing manual or automated system, you need to understand the effect of proposed changes. The study of the current situation provides the basis for understanding the effects of proposed changes and choosing the best alternatives. Business process modelling does not always lead to building software. Instead, some changes in procedures and the way roles are allocated might be the best way of making a necessary improvement.

* Form

### There are many different notations suitable for building business process models, for example: activity diagrams, business process diagrams, swimlane diagrams, dataflow diagrams.

## 6b. The Context of the Work

* Content

### The work context diagram identifies the boundaries of the work that you need to investigate in order to be able to build the product. Note that it includes more than the intended product. Unless you understand the work that the product will support, you have little chance of building a product that will fit cleanly into its environment.

### The adjacent systems on the example context diagram (e.g., Weather Forecasting Service) indicate other subject matter domains (software systems, hardware systems, people, and organizations) that need to be understood. The interfaces between the adjacent systems and the work context indicate why we are interested in the adjacent system. In the case of Weather Forecasting Service, we can say that we are interested in the details of when, how, where, who, what, and why it produces the District Weather Forecasts information.

* Motivation

### To clearly define the boundary for the study of the work and hence the requirements effort. Without this definition, we have little chance of building a product that will fit seamlessly into its environment.

* Examples

### Gritter Context

### This work context model defines the connections between the part of the world that is under investigation and other people, organizations, hardware and software (referred to as adjacent systems). The inputs and outputs represent the data and material that travels between the work and other parts of the world. The work context is the basis for partitioning the investigation and discovering the requirements.

* Considerations

### The names used on the context diagram should eventually be defined in the data dictionary (section 7). Without these definitions, the context model lacks the required rigor, and it may be misunderstood. Relevant stakeholders must agree to the definitions of the interfaces shown on the context model.

* Form

### A diagram showing the inputs and outputs that flow between the work and the adjacent systems.

### or

### A table that identifies all the inputs and outputs that flow between the work and the adjacent systems

### The names of the inputs and outputs are eventually defined in the data dictionary – see section 7b.

## 6c. Work Partitioning

* Content

### A list showing all business events to which the work responds. Business events are happenings in the real world that affect the work. They also happen because it is time for the work to do something—for example, produce weekly reports, remind non-paying customers, check the status of a device, and so on. The response to each event is called a business use case (known as a BUC); it represents a discrete piece of work that contributes to the total functionality of the work.

### The event list includes the following elements:

● Event name

● Input or triggering data flow from adjacent system (identical with name on context diagram)

● Output/s to adjacent systems (identical with name/s on context diagram)

● Brief summary of the business use case (This is optional, but we have found it is a very useful first step in defining the requirements for the business use case—you can think of it as a mini-scenario.)

● Classes of business data relevant to this event (you won’t know this early in the study of the event, as you go into detail you will start to understand the essential data and you can add it to the event list.)

* Motivation

### To identify logical chunks of the work that can be used as the basis for discovering detailed requirements. These business events also provide the subsystems that can be used as the basis for managing detailed analysis and design. Each business event has a business use case (BUC) whose details can be studied independently. However, all BUCs connect to each other through the stored business data (see section 7a).

* Example

Business Event List

Event Name Input and Output Summary of BUC

|  |  |  |
| --- | --- | --- |
| 1. Weather Station transmits reading | Weather Station Readings (in) | Record the readings as belonging to the weather station. |
| 2. Weather Service forecasts weather | District Weather Forecast (in) | Record the forecast. |
| 3. Road engineers advise changed roads | Changed Road (in) | Record the new or changed road. Check that all appropriate weather stations are attached. |
| 4. Road Engineering installs new Weather Station | New Weather Station (in) | Record the weather station and attach it to the appropriate roads. |
| 5. Road Engineering changes Weather Station | Changed Weather Station (in) | Record the changes to the weather station. |
| 6. Time to test Weather Stations | Failed Weather Station Alert (out) | Determine if any weather stations have not transmitted for two hours, and inform Road Engineering of any failures. |
| 7. Truck Depot changes a truck | Truck Change (in) | Record the changes to the truck. |
| 8. Time to detect icy roads | Road De-icing Schedule (out) | Predict the ice situation for the next two hours. Assign a truck to any roads that will freeze. Issue the schedule. |
| 9. Truck treats a road | Treated Road (in) | Record the road as being in a safe condition for the next three hours. |
| 10 Truck Depot reports problem with truck | Truck Breakdown (in)  Amended Gritting Schedule (out) | Reassign available trucks to the previously assigned roads. |
| 11. Time to monitor road treatment | Untreated Road Reminder (out) | Check that all scheduled roads have been treated in the assigned time, and issue reminders for any untreated roads. |
|  |  |  |

* Considerations

### Attempting to list the business events and do a one-sentence summary of each of the BUCs is a way of testing the work context. This activity uncovers uncertainties and misunderstandings about the project and facilitates precise communications. When you do an event analysis, it will usually prompt you to make some changes to your work context diagram.

### We suggest you gather requirements for discrete sections of the work. This requires you to partition the work, and we have found business events to be the most convenient, consistent, functionally cohesive and natural way to break the work into manageable units and to be able to trace the details back to the scope of the work.

* Form

### Business event list/table containing for each event: Event number, Event name, Name of input, Name of output/s, Summary of the business event response. For reasons of traceability, the names of the inputs and outputs on the business event list must match the names on the work context model/table ref. 6.b

## 6d. Specifying a Business Use Case (BUC)

* Content

A specification of the details of how a Business Use Case (BUC) responds to a Business Event. You can assess how well you understand the BUC by attempting to write its business fit criterion. To do this ask yourself: how will I know whether this BUC has carried out the intention of the business response to the business event?

* Motivation

### To understand the detailed business response that must be carried out when a business event takes place and provide a basis for discovering the detailed requirements. The understanding of the BUC also provides the basis for discussing which parts of the BUC should be carried out by the product that will be built. If you are using stories, then the equivalent of a BUC is a Business Story.

* Example

### In the sample specifications included with the download of this template you will find examples of BUC scenarios.

* Considerations

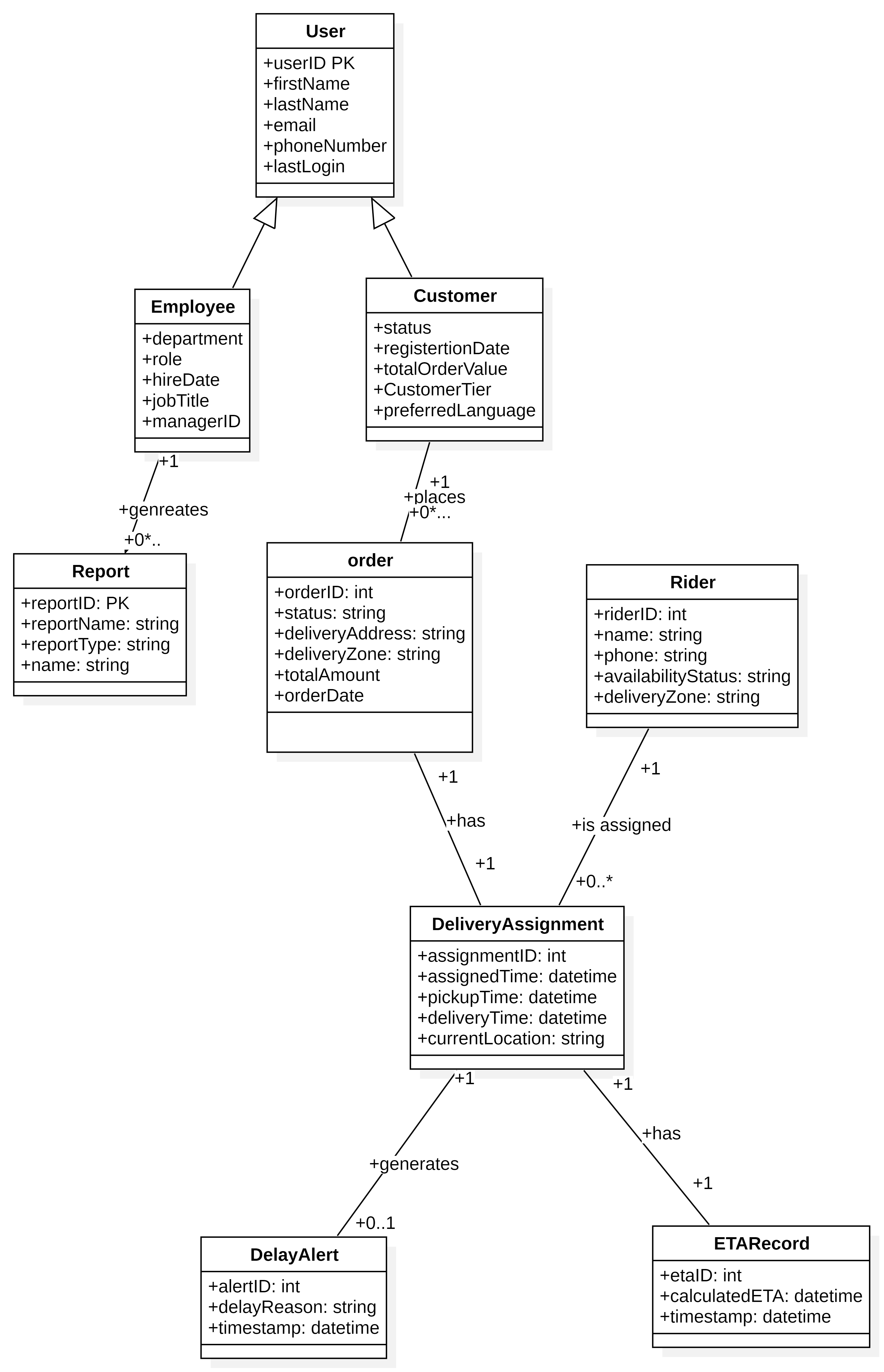
### Whatever approach you use to specify the details of a BUC, you should stay within the boundary of the input and output/s for that business event. If you discover additional input or output data, then it is an indication that you need to make changes to the input/output data on the event list and also on the work context diagram.

* Form

### A BUC can be specified using any combination of models that suits the analyst. The most common approaches are: activity diagrams, BUC scenarios, process flow diagrams, sequence diagrams, business stories, mind maps, interview notes.... The only caveat is that the inputs and outputs on your BUC are precisely the same and hence traceable to the inputs and outputs on the corresponding Business Event.

# 7. Business Data Model and Data Dictionary

## 7a. Business Data Model

* 

## 

## A diagram of a computer flowchart AI-generated content may be incorrect.

### A diagram of a computer flowchart AI-generated content may be incorrect.

## 7b. Data Dictionary

* This data dictionary defines the key data entities, their attributes, and relationships for the Breadfast CRM system. It provides an unambiguous definition for all data flows and elements referenced in the requirements, use cases, and models. This serves as the single source of truth for business and technical teams.

| * Name | * Content | * Type |
| --- | --- | --- |
| * Alert | * A system-generated notification triggered by a specific state change or condition. | * Class |
| * Complaint | * A record of a customer issue or grievance that requires tracking and resolution. | * Class |
| * Customer | * An individual or entity that places orders with Breadfast. A key business entity. | * Class |
| * CustomerSegment | * A defined group of customers sharing common attributes or behaviors. | * Class |
| * Delivery | * Represents the fulfillment and logistics process for a specific order. | * Class |
| * DeliveryAssignment | * The record linking a Rider to a Delivery for a specific Order. | * Class |
| * Employee | * An internal user of the system (e.g., Agent, Dispatcher, Manager). | * Class |
| * ETARecord | * A stored Estimated Time of Arrival for a delivery, with a timestamp. | * Class |
| * Inventory | * The current stock level and status for a specific Product. | * Class |
| * LowStockAlert | * A specific type of Alert generated when stock falls below a defined threshold. | * Class |
| * Message | * A communication between a Customer and an Employee. | * Class |
| * Order | * A customer's request for products, representing a commercial transaction. | * Class |
| * OrderItem | * A line item detailing the Product and quantity within an Order. | * Class |
| * Product | * An item sold by Breadfast (e.g., bakery item, grocery). | * Class |
| * PurchaseOrder (PO) | * A formal request sent to a Supplier to restock Products. | * Class |
| * POItem | * A line item detailing the Product and quantity within a PurchaseOrder. | * Class |
| * Refund | * A record of a monetary reimbursement to a customer, often linked to a cancelled Order. | * Class |
| * Report | * A generated summary of data for analysis, filtered by specific criteria. | * Class |
| * Rider | * A specific type of Employee responsible for delivering orders. | * Class |
| * StockAdjustment | * A manual record of a change to inventory levels (e.g., due to damage, count error). | * Class |
| * StockDelivery | * A record of goods received from a Supplier against a PurchaseOrder. | * Class |
| * Supplier | * A company that provides Products to Breadfast. | * Class |
| * SurveyResponse | * Feedback provided by a customer, typically after a resolved complaint or order. | * Class |
| * Customer Profile Data | * {Customer ID + Customer Name + Email + Phone + Address + Status + Segment Memberships} | * Dataflow |
| * Low-Stock Alert | * {Alert ID + Product ID + Product Name + Current Quantity + Threshold + Timestamp} | * Dataflow |
| * New Support Ticket | * {Complaint ID + Customer ID + Order ID (optional) + Description + Timestamp} | * Dataflow |
| * Real-Time Dashboard Data | * {Total Revenue + Orders Today + Active Deliveries + Open Complaints + Top Products} | * Dataflow |
| * Active Status | * Enumeration: "Active", "Inactive". Determined by recent activity. | * Attribute/Element |
| * Address | * The customer's delivery address, including street, city, and zone. | * Attribute/Element |
| * Alert ID | * System-generated unique identifier (e.g., UUID). | * Attribute/Element |
| * Alert Type | * Enumeration: "Delivery Delay", "SLA Breach", "Low Stock". | * Attribute/Element |
| * Assigned Date/Time | * Timestamp when a Delivery was assigned to a Rider. YYYY-MM-DD HH:MM:SS | * Attribute/Element |
| * Complaint Description | * The detailed text of the issue reported by the customer. | * Attribute/Element |
| * Complaint ID | * \*System-generated unique identifier (e.g., CR-2025-001).\* | * Attribute/Element |
| * Complaint Status | * Enumeration: "New", "In Progress", "Resolved", "Escalated". | * Attribute/Element |
| * Current Quantity | * \*The real-time number of units of a Product in stock. Integer, >= 0.\* | * Attribute/Element |
| * Customer ID | * \*System-generated unique identifier (e.g., CUST-10001).\* | * Attribute/Element |
| * Customer Name | * Full name of the customer. String, max 255 characters. | * Attribute/Element |
| * Delivery Status | * Enumeration: "Assigned", "Picked Up", "In Transit", "Delivered", "Failed". | * Attribute/Element |
| * Email | * Customer's email address. Must be valid format. | * Attribute/Element |
| * Employee ID | * \*System-generated unique identifier for staff (e.g., EMP-2001).\* | * Attribute/Element |
| * Employee Role | * Enumeration: "Support Agent", "Dispatcher", "Manager", "Admin". | * Attribute/Element |
| * Estimated Delivery Time | * The predicted time of delivery. YYYY-MM-DD HH:MM:SS | * Attribute/Element |
| * Message Body | * The content of the communication. Text. | * Attribute/Element |
| * Order ID | * \*System-generated unique identifier (e.g., ORD-30001).\* | * Attribute/Element |
| * Order Status | * Enumeration: "Received", "Preparing", "Ready", "Out for Delivery", "Delivered", "Cancelled". | * Attribute/Element |
| * Phone | * Customer's primary contact number. String. | * Attribute/Element |
| * Product ID | * \*System-generated unique identifier for a product (e.g., PROD-5001).\* | * Attribute/Element |
| * Product Name | * Name of the product. String, max 255 characters. | * Attribute/Element |
| * Product Status | * Enumeration: "In Stock", "Low Stock", "Out of Stock". | * Attribute/Element |
| * Purchase Order ID | * \*System-generated unique identifier (e.g., PO-4001).\* | * Attribute/Element |
| * Quantity | * The number of units in an OrderItem or POItem. Integer, > 0. | * Attribute/Element |
| * Re-order Threshold | * The minimum stock level that triggers a LowStockAlert. Integer. | * Attribute/Element |
| * Resolution Notes | * Text documenting how a Complaint was resolved. | * Attribute/Element |
| * Rider ID | * A unique identifier for a Rider, which is a subset of Employee ID. | * Attribute/Element |
| * Segment Name | * A descriptive name for a customer group (e.g., "High-Value", "Frequent Buyers"). | * Attribute/Element |
| * SLA Deadline | * The timestamp by which a Complaint should be resolved. YYYY-MM-DD HH:MM:SS | * Attribute/Element |
| * Supplier ID | * \*System-generated unique identifier (e.g., SUP-6001).\* | * Attribute/Element |
| * Timestamp | * The date and time an event occurred. YYYY-MM-DD HH:MM:SS | * Attribute/Element |
| * Total Amount | * The monetary value of an Order or Refund. Decimal, 2 decimal places. | * Attribute/Element |

# 8. The Scope of the Product

## 8a. Product Boundary

## 

## A diagram of a product AI-generated content may be incorrect.

## 8b. Product Use Case Table

|  |  |
| --- | --- |
| Use Case Name | Brief Description |
| Produce Sales Performance Dashboard | The system retrieves and displays key sales metrics (revenue, orders, top products) in a unified dashboard view upon user request. |
| Generate Inventory Analytical Report | The system creates a tailored report with charts and summaries based on user-selected filters like date range, product category, or region. |
| Generate Customer Segmentation Analysis | The system groups customers into segments (e.g., high-value, frequent buyers) based on defined rules and displays the results for analysis. |
| Produce Daily Performance Summary | The system automatically compiles and formats a summary report of the day's sales, delivery, and inventory data at a scheduled time. |
| Update Real-Time Dashboard Data | The system automatically polls the database at regular intervals and refreshes all dashboard visualizations with the latest data. |
| Produce Weekly Delivery Performance Report | The system automatically calculates and generates a report on delivery metrics (times, success rates) for the previous week at a scheduled time. |

System analytics dashboard Management system

* Customer Management system:

|  |  |
| --- | --- |
| Use Case Name | Brief Description |
| Create Customer Profile | The system captures registration details and stores a new customer record in the database when a new account is created. |
| Update Customer Information | The system validates and saves modified personal data when customer information is edited by support staff. |
| Retrieve Customer Information | The system searches for and displays complete customer records based on lookup criteria entered by support agents. |
| Segment Customers | The system organizes customers into dynamic groups using filters such as region, purchase frequency, and total spending. |
| Generate Customer Summary Report | The system produces a summarized report of customer data based on management-selected filters for analysis purposes. |
| Generate Monthly Customer Report | The system automatically compiles monthly customer activity statistics on a scheduled date and time. |
| Generate Active Customer Report | The system generates a weekly list of active customers based on recent activity and engagement metrics. |
| Update Customer Status | The system updates the customer’s status (e.g., Active → Inactive) based on behavior or detected inactivity rules. |
| Receive & Route Customer Message | The system accepts incoming customer messages and routes them to the appropriate support agents for handling. |
| Send Message to Customer | The system enables support agents to send responses or follow-up messages to customers directly from the dashboard. |
| Resolve Customer Complaint | The system marks support tickets as resolved and updates complaint history when an agent finishes handling the issue. |
| Update Customer Profile | The system applies changes to stored profile attributes when updates are performed by customers or support agents. |
| Request Customer Feedback | The system automatically sends customer satisfaction surveys after complaints or issues have been resolved for a set duration. |
| Create Complaint Record | The system creates a new complaint ticket when a customer submits an issue or message requiring escalation. |
| Escalate Unresolved Complaint | The system detects overdue complaints that exceeded the SLA deadline and automatically escalates them to higher support levels. |

### 

### Order Management system:

|  |  |
| --- | --- |
| Use Case Name | Brief Description |
| Retrieve Order Status | Provides real-time tracking and status details of a customer order. |
| Generate Order Report | Produces filtered analytics on orders based on manager-selected criteria. |
| Cancel Order | Marks the order as cancelled and triggers a refund if applicable. |
| Generate Weekly Delivery Report | Summarizes weekly delivery performance every Sunday morning. |
| Change Order State | Updates the state of an order based on internal system or dispatcher input. |
| Complete Order | Marks an order as delivered and logs it into order history. |
| Notify Inventory Staff | Alerts staff when item stock is insufficient during checkout. |

### Delivery and dispatch:

|  |  |
| --- | --- |
| Use Case Name | Brief Description |
| Assign Order to Rider | The system automatically assigns a "Ready" order to an available rider based on predefined rules (proximity, workload). |
| Record Order Pickup | The system updates the order status to "Picked Up," records the timestamp, and may trigger a customer notification. |
| Record Order Delivery | The system updates the order status to "Delivered," records the timestamp, and finalizes the order lifecycle. |
| Notify Customer of ETA | The system automatically calculates and sends an estimated delivery time to the customer via their preferred channel. |

### Inventory and supplier Management system:

|  |  |
| --- | --- |
| Use Case Name | Brief Description |
| Add Supplier Details | The system records supplier information (name, contact, related products) and stores it in the supplier database. |
| Edit Supplier Information | The system retrieves an existing supplier record, applies updates, and saves the modified data. |
| Record Purchase Order | The system registers a new purchase order with supplier, items, quantities, and expected delivery details. |
| Record Restocking | The system updates inventory levels when goods are received and marks the corresponding purchase order as fulfilled or partial. |
| Record Stock Adjustment | The system allows authorized users to adjust stock levels and logs the reason (e.g., damage, returns, manual count). |
| Generate Inventory / Restocking Report | The system automatically compiles stock data and generates daily or weekly reports summarizing stock status and restocking needs. |
| Generate Sales and Demand Report | The system analyzes past sales and restocking patterns and produces demand forecasts. |
| Generate Low-Stock Alert | The system automatically triggers a low-stock notification when a product’s quantity falls below a predefined threshold. |
| Close Purchase Order | The system marks the purchase order as completed when all items have been received and archives it into restocking history. |

# 9. Functional Requirements

## 9a. Functional Requirements

Format Legend:

* Source: Traceability to originating User Story (US) or Event.

**Customer Management System:**

| Event/Use Case | Description | Rationale | Source | Fit Criterion |
| --- | --- | --- | --- | --- |
| Retrieve Customer Information | The system shall allow searching for customers by name, email, or phone number. | To enable agents to quickly find customer profiles. | US: View Customer Profile | When an agent enters a valid name, email, or phone number, the system returns matching customer records within 2 seconds. |
| Retrieve Customer Information | The system shall display search results sorted alphabetically by customer name. | To allow for quick scanning of results. | US: View Customer Profile | The list of customers in the search results is displayed in ascending alphabetical order (A-Z) by the Customer Name attribute. |
| Retrieve Customer Information | The system shall display a complete customer profile, including personal details, contact info, past orders, and complaint records, in a unified view. | To provide a 360-degree view of the customer for accurate support. | US: View Customer Profile | The customer profile screen contains dedicated, populated sections for Personal Details, Contact Info, Order History, and Complaint History. |
| Update Customer Information | The system shall allow authorized agents to edit fields marked as editable (e.g., contact phone, delivery preferences). | To keep customer data accurate and up-to-date. | US: Edit Customer Info | An agent can change the value in an authorized field and save the change successfully. |
| Update Customer Information | The system shall prevent unauthorized agents from editing restricted fields (e.g., payment information, purchase history). | To maintain data integrity and security. | US: Edit Customer Info | When an unauthorized agent attempts to edit a restricted field, the input control is disabled or read-only. |
| Update Customer Information | The system shall log all changes to customer data, including the timestamp and the ID of the agent who made the change. | For audit trail and compliance. | US: Edit Customer Info | For every update, a new record is created in the AuditLog table with the changed fields, new values, Agent ID, and Timestamp. |
| Receive & Route Message | The system shall create a new message record and link it to the customer's profile when a message is received via an integrated channel. | To maintain a complete communication history. | US: Send/Receive Messages | A new entry appears in the customer's message history immediately after a message is received from an external channel (e.g., WhatsApp, in-app chat). |
| Send Message to Customer | The system shall allow an agent to compose and send a message to a customer directly from the CRM dashboard. | To handle customer communication without switching apps. | US: Send/Receive Messages | An agent can select a customer, type a message in the dashboard interface, and upon sending, the message is delivered to the customer's preferred channel. |
| Resolve Customer Complaint | The system shall allow an agent to change the status of a complaint to "Resolved." | To track the completion of support tasks. | US: Track Complaint Status | From a complaint with status "New" or "In Progress," an agent can select "Resolved" from a dropdown and save the change. |
| Track Complaint Status | The system shall automatically record the time elapsed between a complaint's creation and its resolution. | To measure support efficiency and SLA compliance. | US: Track Complaint Status | The system calculates and stores the difference between the Resolved Timestamp and Created Timestamp for every complaint. |
| Track Complaint Status | The system shall send a notification if a complaint remains in a non-"Resolved" status for more than 24 hours. | To proactively escalate potential delays. | US: Track Complaint Status | A dashboard alert is generated for any complaint where the Current Timestamp minus Created Timestamp is greater than 24 hours and Status != "Resolved". |
| Segment Customers | The system shall allow a sales user to filter customers based on purchase frequency, total spending, and preferred product categories. | To enable targeted marketing campaigns. | US: Create Customer Segments | The user interface provides filter controls for Orders Count, Total Spend, and Product Category which, when applied, dynamically update the displayed list of customers. |

**Order Management Subsystem:**

| Event/Use Case | Description | Rationale | Source | Fit Criterion |
| --- | --- | --- | --- | --- |
| Retrieve Order Status | The system shall display the current status (e.g., Preparing, Out for Delivery) and the last updated timestamp for a given order. | To provide agents and customers with accurate, real-time order information. | US: Check Order Status | The order details page for any order shows the Order Status and Last Updated Timestamp fields. |
| Retrieve Order Status | The system shall display the name and contact information of the assigned rider if the order status is "Out for Delivery" or similar. | To facilitate coordination for delayed deliveries. | US: Check Order Status | When Order Status is "Out for Delivery," the Rider Name and Rider Phone fields are visible on the order details page. |
| Retrieve Order Status | The system shall display a history of status changes for an order, with timestamps for each change. | To provide a full audit trail of the order's progress. | US: Check Order Status | A "Status History" section on the order details page lists all previous statuses (e.g., Received -> Preparing -> Ready) with the exact time of each transition. |
| Cancel Order | The system shall allow a customer or agent to cancel an order if its current status is "Received" or "Preparing". | To honor cancellation requests before significant resources are committed. | US: Cancel Order | The "Cancel Order" button is active and functional only when Order Status is "Received" or "Preparing". |
| Cancel Order | The system shall initiate a refund process when an order is cancelled. | To ensure customers are reimbursed for cancelled orders. | US: Cancel Order | Upon successful cancellation, a new Refund record is created with Status = "Pending" and linked to the cancelled order. |
| Change Order State | The system shall allow a dispatcher or kitchen staff to update the order status according to a predefined lifecycle (e.g., Preparing -> Ready for Pickup). | To track the order through its fulfillment stages. | Event: Order is Ready for Delivery | An authorized user can select a new status from a predefined list, and upon saving, the Order Status and Last Updated Timestamp are updated. |

### Inventory & Supplier Management Subsystem

| Event/Use Case | Description | Rationale | Source | Fit Criterion |
| --- | --- | --- | --- | --- |
| Track Stock Levels | The system shall display the current quantity, stock status (In Stock, Low, Out of Stock), and last restocked date for each product on the inventory dashboard. | To give inventory managers an immediate overview of stock health. | US: Track Stock Levels | The inventory dashboard grid includes columns for Current Quantity, Stock Status, and Last Restocked Date for every product. |
| Generate Low-Stock Alert | The system shall automatically change a product's status to "Low Stock" when its Current Quantity falls below its Re-order Threshold. | To provide a clear visual indicator of items needing restocking. | Event: Inventory Level Falls Below Threshold | The Stock Status field for a product updates to "Low Stock" within 1 minute of its Current Quantity being saved at a value less than its Re-order Threshold. |
| Generate Low-Stock Alert | The system shall create a LowStockAlert record and display it on the inventory dashboard when a low-stock condition is detected. | To proactively notify staff. | Event: Inventory Level Falls Below Threshold | A new alert appears in a dedicated "Alerts" panel on the dashboard when the condition in FR-INV-002 is met. |
| Add Supplier Details | The system shall allow a purchasing officer to create a new supplier record by entering name, contact information, and associated products. | To maintain a master list of suppliers for procurement. | US: Add/Edit Supplier | The user can navigate to a "New Supplier" form, input data into the required fields, and save, resulting in a new record in the Supplier table. |
| Record Purchase Order | The system shall allow a purchasing officer to create a purchase order (PO) by selecting a supplier and adding products with quantities. | To formalize the restocking process. | US: Record Purchase Order | The user can create a new PO, link it to a Supplier, add multiple Product lines with Quantity, and save it with a status of "Pending". |
| Record Restocking | The system shall allow warehouse staff to update inventory quantities by confirming receipt of goods against a Purchase Order. | To accurately reflect received stock in the system. | US: Record Restocking | A user can select an open PO, mark line items as received, and the system updates the Current Quantity for each received product. |

### Delivery & Dispatch Management Subsystem

| Event/Use Case | Description | Rationale | Source | Fit Criterion |
| --- | --- | --- | --- | --- |
| Assign Order to Rider | The system shall automatically suggest available riders for a "Ready" order based on proximity to the pickup location and current workload. | To optimize delivery efficiency. | US: Assign Order to Rider | The dispatch interface, when an order is ready, displays a list of riders sorted by proximity (closest first) and with fewer than 3 active deliveries. |
| Record Order Pickup | The system shall update the order status to "Picked Up" and record the timestamp when a rider confirms pickup. | To accurately track the delivery lifecycle. | US: Record Order Pickup | When a rider clicks "Picked Up" in the rider app, the linked Order Status changes to "Picked Up" and the Picked Up Timestamp is set. |
| Record Order Delivery | The system shall update the order status to "Delivered" and record the timestamp when a rider confirms delivery. | To finalize the order and record successful completion. | US: Record Order Delivery | When a rider clicks "Delivered" in the rider app, the linked Order Status changes to "Delivered" and the Delivered Timestamp is set. |
| Notify Customer of ETA | The system shall automatically send an ETA notification to the customer via their preferred channel 2 minutes after an order is marked "Picked Up". | To keep the customer informed and improve satisfaction. | Event: Time to Send ETA | A message is queued for delivery to the customer 120 seconds after the Picked Up Timestamp is recorded. |
| Flag Potential Delay | The system shall create a DelayAlert if the current time exceeds the Estimated Delivery Time for an order with status "In Transit". | To proactively identify and manage delayed deliveries. | Event: Delivery Taking Longer | An alert is generated if Order Status is "In Transit" and the system time is greater than the Estimated Delivery Time. |

### Analytics & Reporting Subsystem

| Event/Use Case | Description | Rationale | Source | Fit Criterion |
| --- | --- | --- | --- | --- |
| Produce Sales Performance Dashboard | The system shall display real-time total revenue, number of orders, and average order value for the current day. | To provide a high-level snapshot of sales performance. | US: View Sales Dashboard | The sales dashboard shows calculated values for Total Revenue, Orders Count, and Average Order Value that update within 5 minutes of a new order being placed. |
| Produce Sales Performance Dashboard | The system shall list the top 5 best-selling and bottom 5 worst-selling products for a selected date range. | To identify product trends. | US: View Sales Dashboard | When a user selects a date range and clicks "Apply," two lists are generated: one with the 5 products with the highest Quantity Sold and one with the 5 products with the lowest. |
| Generate Customer Segmentation Analysis | The system shall dynamically update customer segment memberships (e.g., "High-Value") as new orders are placed. | To ensure segments are always based on the most current data. | US: Create Customer Segments | A customer's membership in the "High-Value" segment (Total Spend > $500) is re-evaluated and updated within 1 hour of them placing a new order. |

Techniques Used

* Stakeholder interviews
* Questionnaires
* Review of current documentation
* Industry research

Supporting Materials

Breadfast CRM Internal User Questionnaire

This questionnaire is being sent to all internal operational staff. As you know, Breadfast is developing a new integrated CRM system to streamline our operations and improve customer service.  
The purpose of this questionnaire is to obtain preliminary information to assist in defining the requirements for the new system. Follow-up discussions will be held to permit everybody to elaborate on their needs and ideas.

Part I. Please answer these questions based on a typical workday

1. On average, how many customer inquiries (calls, chats, emails) do you handle per day? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. How many different systems or screens do you need to open to resolve a single customer issue? \_\_\_\_\_\_
3. How many times per day do you have to contact another department (e.g., call Delivery, email Warehouse) to get information for a customer? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Estimate the percentage of your shift spent on manual data entry or updating records in multiple places. \_\_\_\_\_\_%
5. How many times per day do you encounter issues due to outdated or incorrect order status information? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. For delivery teams: How many orders are typically reassigned manually per shift due to inefficiencies? \_\_\_\_\_\_\_\_

Part II. Circle the appropriate number on the scale from 1 to 7 based on how strongly you agree or disagree with the statement.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Question | Strongly Agree Strongly Disagree | | | | | | |
| It would help me do my job better to have a single, unified view of all customer information (profile, order history, communications). | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| A real-time dashboard showing order status from kitchen to delivery would significantly reduce customer complaints. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Having all customer communication (email, chat, call) in one place would make me more efficient. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Automated low-stock alerts would help prevent issues with customer orders. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| A system that automatically assigns delivery riders based on location and workload would improve delivery times. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| The current process for finding basic customer or order information is slow and frustrates both me and the customer. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Internal Executive Interview — Breadfast CRM System

Role Interviewed: Operations Manager (Internal Executive).

1. How satisfied are you with the current process of managing orders

How do you currently manage and oversee the end-to-end process of order handling and delivery operations?  
 *(Please describe your workflow from order placement to successful delivery.)*

1. What specific information or inputs do you and your team need to start your daily operations, and what outputs or reports do you generate?
2. How satisfied are you with the current process of managing orders and deliveries?  
    ☐ Very satisfied ☐ Somewhat satisfied ☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied
3. What are the most common challenges you and your team face during the daily delivery and coordination process?
4. What manual or repetitive tasks take up most of your team’s time and should be automated in the new CRM system?
5. What specific CRM features do you believe would most improve coordination between Customer Support, Delivery, and Operations?
6. Should all departments have full access to customer and order data, or should access be role-based?  
    ☐ Full access for all ☐ Role-based access only ☐ Not sure  
    Why?
7. What types of dashboards or reports would help you make faster, data-driven operational decisions?
8. In your view, what would define a successful CRM system implementation six months after launch?

Analysis:

The system vision identified major problems in the current Breadfast operations, including fragmented customer and order data, lack of real-time visibility across departments, manual rider assignment, and absence of integrated analytics for management. These issues lead to delays, inefficient operations, and poor customer support performance.

The user stories and stakeholder inputs showed a clear need for a unified CRM platform that integrates customer management, order tracking, delivery and dispatch, inventory management, and sales analytics into one system.

The event decomposition and subsystem breakdown confirmed that these needs can be logically organized into five main modules: Customer Management, Order Management, Delivery & Dispatch, Inventory & Supplier Management, and Sales & Analytics.

Therefore, the functional requirements and use cases defined in the project were derived directly from the identified problems and stakeholder needs, ensuring that the proposed CRM system addresses Breadfast’s operational inefficiencies and supports better decision-making and customer service.

# Non-functional Requirements

The following sections 10-17 describe the non-functional requirements. The form of these requirements is the same as for the functional requirements as described in section 9 above.

# 10. Look and Feel Requirements

## 10a. Appearance Requirements

* Content

### The section contains requirements relating to the spirit of the product. Your client may have made particular demands for the product, such as corporate branding, colours to be used, and so on. This section captures the requirements for the appearance. Do not attempt to design it until the appearance requirements are known.

* Motivation

### To ensure that the appearance of the product conforms to the organization’s expectations.

* Examples

The product shall be attractive to a teenage audience.

The product shall comply with corporate branding standards.

* Fit Criterion

A sampling of representative teenagers shall, without prompting or enticement, start using the product within four minutes of their first encounter with it.

The office of branding shall certify that the product complies with the current standards.

* Considerations

### Even if you are using prototypes, it is important to understand the requirements for the appearance. The prototype is used to help elicit requirements; it should not be thought of as a substitute for the requirements.

## 10b. Style Requirements

* Content

### Requirements that specify the mood, style, or feeling of the product, which influences the way a potential customer will see the product. Also, the stakeholders’ intentions for the amount of interaction the user is to have with the product.

### In this section, you would also describe the appearance of the package if this is to be a manufactured product. The package may have some requirements as to its size, style, and consistency with other packages put out by your organization. Keep in mind the European laws on packaging, which require that the package not be significantly larger than the product it encloses.

### The style requirements that you record here will guide the designers to create a product as envisioned by your client.

* Motivation

### Given the state of today’s market and people’s expectations, we cannot afford to build products that have the wrong style. Once the functional requirements are satisfied, it is often the appearance and style of products that determine whether they are successful. Your task in this section is to determine precisely how the product shall appear to its intended consumer.

* Example

The product shall appear authoritative.

* Fit Criterion

After their first encounter with the product, 70 per cent of representative potential customers shall agree they feel they can trust the product.

* Considerations

### The look and feel requirements specify your client’s vision of the product’s appearance. The requirements may at first seem to be rather vague (e.g., “conservative and professional appearance”), but these will be quantified by their fit criteria. The fit criteria give you the opportunity to extract from your client precisely what is meant and give the designer precise instructions on what he is to accomplish.

# 11. Usability and Humanity Requirements

This section is concerned with requirements that make the product usable and ergonomically acceptable to its hands-on users. There are other requirements types that might have an effect on Usability and Humanity. You can find these in Section 16 – Cultural Requirements.

## 11a. Ease of Use Requirements

* Content

### This section describes your client’s aspirations for how easy it is for the intended users of the product to operate it. The product’s usability is derived from the abilities of the expected users of the product and the complexity of its functionality.

### The usability requirements should cover properties such as these:

● Efficiency of use: How quickly or accurately the user can use the product.

● Ease of remembering: How much the casual user is expected to remember about using the product.

● Error rates: For some products it is crucial that the user commits very few, or no, errors.

● Overall satisfaction in using the product: This is especially important for commercial, interactive products that face a lot of competition. Web sites are a good example.

● Feedback: How much feedback the user needs to feel confident that the product is actually accurately doing what the user expects. The necessary degree of feedback will be higher for some products (e.g., safety-critical products) than for others.

* Motivation

### To guide the product’s designers toward building a product that meets the expectations of its eventual users.

* Examples

The product shall be easy for 11-year-old children to use.

The product shall help the user to avoid making mistakes.

The product shall make the users want to use it.

The product shall be used by people with no training, and possibly no understanding of English.

* Fit Criterion

### These examples may seem simplistic, but they do express the intention of the client. To completely specify what is meant by the requirement, you must add a measurement against which it can be tested—that is, a fit criterion. Here are the fit criteria for the preceding examples:

Eighty percent of a test panel of 11-year-old children shall be able to successfully complete [list of tasks] within [specified time].

One month’s use of the product shall result in a total error rate of less than 1 percent.

An anonymous survey shall show that 75 percent of the intended users are regularly using the product after a three-week familiarization period.

* Considerations

### Refer to section 3, Users of the Product, to ensure that you have considered the usability requirements from the perspective of all the different types of users.

### It may be necessary to have special consulting sessions with your users and your client to determine whether any special usability considerations must be built into the product.

### You could also consider consulting a usability laboratory experienced in testing the usability of products that have a project situation (sections 1–7 of this template) similar to yours.

## 11b. Personalization and Internationalization Requirements

* Content

### This section describes the way in which the product can be altered or configured to take into account the user’s personal preferences or choice of language.

### The personalization requirements should cover issues such as the following:

● Languages, spelling preferences, and language idioms

● Currencies, including the symbols and decimal conventions

● Personal configuration options

* Motivation

### To ensure that the product’s users do not have to struggle with, or meekly accept, the builder’s cultural conventions.

* Examples

The product shall retain the buyer’s buying preferences.

The product shall allow the user to select a chosen language.

* Considerations

### Consider the country and culture of the potential customers and users of your product. Any out-of-country users will welcome the opportunity to convert to their home spelling and expressions.

### By allowing users to customize the way in which they use the product, you give them the opportunity to participate more closely with your organization as well as enjoy their own personal user experience.

### You might also consider the configurability of the product. Configurability allows different users to have different functional variations of the product.

## 11c. Learning Requirements

* Content

### Requirements specifying how easy it should be to learn to use the product. This learning curve ranges from zero time for products intended for placement in the public domain (e.g., a parking meter or a web site) to a considerable amount of time for complex, highly technical products. (We know of one product where it was necessary for graduate engineers to spend 18 months in a training program before being qualified to use the product.)

* Motivation

### To quantify the amount of time that your client feels is allowable before a user can successfully use the product. This requirement guides designers to understand how users will learn the product. For example, designers may build elaborate interactive help facilities into the product, or the product may be packaged with a tutorial. Alternatively, the product may have to be constructed so that all of its functionality is apparent upon first encountering it.

* Examples

The product shall be easy for an engineer to learn.

A clerk shall be able to be productive within a short time.

The product shall be able to be used by members of the public who will receive no training before using it.

The product shall be used by engineers who will attend five weeks of training before using the product.

* Fit Criterion

An engineer shall produce a [specified result] within [specified time] of beginning to use the product, without needing to use the manual.

After receiving [number of hours] training a clerk shall be able to produce [quantity of specified outputs] per [unit of time].

[Agreed percentage] of a test panel shall successfully complete [specified task] within [specified time limit].

The engineers shall achieve [agreed percentage] pass rate from the final examination of the training.

* Considerations

### Refer to section 2d, Hands-On Users of the Product, to ensure that you have considered the ease of learning requirements from the perspective of all the different types of users.

## 11d. Understandability and Politeness Requirements

This section is concerned with discovering requirements related to concepts and metaphors that are familiar to the intended end users.

* Content

### This specifies the requirement for the product to be understood by its users. While “usability” refers to ease of use, efficiency, and similar characteristics, “understandability” determines whether the users instinctively know what the product will do for them and how it fits into their view of the world. You can think of understandability as the product being polite to its users and not expecting them to know or learn things that have nothing to do with their business problem. Another aspect of politeness is that the product should not expect the user to input any information to which the product already has access.

* Motivation

### To avoid forcing users to learn terms and concepts that are part of the product’s internal construction and are not relevant to the users’ world. To make the product more comprehensible and thus more likely to be adopted by its intended users.

* Examples

The product shall use symbols and words that are naturally understandable by the user community.

The product shall hide the details of its construction from the user.

* Considerations

### Refer to section 2d, Hands-On Users of the Product, and consider the world from the point of view of each of the different types of users.

## 11e. Accessibility Requirements

* Content

### The requirements for how easy it should be for people with common disabilities to access the product. These disabilities might be related to physical disability or visual, hearing, cognitive, or other abilities.

* Motivation

### In many countries it is required that some products be made available to the disabled. In any event, it is self-defeating to exclude this sizable community of potential customers.

* Examples

The product shall be usable by partially sighted users.

The product shall be usable by wheelchair users.

The product shall conform to the Americans with Disabilities Act.

* Considerations

### Some users have disabilities other than the commonly described ones. In addition, some partial disabilities are fairly common. A simple, and not very consequential, example is that approximately 20 per cent of males are red-green colour-blind.

## 11f. Convenience Requirements

* Content

### The requirements for things the product shall do to simplify tasks, and to expedite and make the user/customer’s work easier and smoother.

* Motivation

### People have become more and more accustomed to convenience. Unless you provide as much convenience as possible, your users / customers will shun your product. Given the technology we have available, there are more and more opportunities for the products we build to do some of the work that the user/customer used to have to do himself. Products can also do new, convenient things for the customer – often things the customer would not have dreamed of asking for.

* Examples

The product shall inform the customer of his bank balance every Monday morning using the secure communication channel of the customer’s choice.

The product shall identify the customer without the need for asking security questions. (e.g. using fingerprint or voice recognition software)

The product shall process payment for the taxi journey without the need for customer interaction.

* Considerations

### Look at your stakeholder map and stakeholder analysis (2d. 2e.) and consider what would make the product more convenient for a person in that situation? What would it be like to be that person using the product? Often people will not mention convenience requirements because they do not know what is possible. But if the product is inconvenient that is when people complain.

# 12. Performance Requirements

## 12a. Speed and Latency Requirements

* Content

### Specifies the amount of time available to complete specified tasks. These requirements often refer to response times. They can also refer to the product’s ability to operate at a speed suitable for the intended environment.

* Motivation

### Some products—usually real-time products—must be able to perform some of their functionality within a given time slot. Failure to do so may mean catastrophic failure (e.g., a ground-sensing radar in an airplane fails to detect an upcoming mountain) or the product will not cope with the required volume of use (e.g., an automated ticket-selling machine).

* Examples

Any interface between a user and the automated system shall have a maximum response time of 2 seconds.

The response shall be fast enough to avoid interrupting the user’s flow of thought.

The product shall poll the sensor every 10 seconds.

The product shall download the new status parameters within 5 minutes of a change.

* Fit Criterion

### Fit criteria are needed when the description of the requirement is not quantified. However, we find that most performance requirements are stated in quantified terms. The exception is the second requirement shown above, for which the suggested fit criterion is

The product shall respond in less than 1 second for 90 per cent of the interrogations. No response shall take longer than 2.5 seconds.

* Considerations

### There is a wide variation in the importance of different types of speed requirements. If you are working on a missile guidance system, then speed is extremely important. By contrast, an inventory control report that is run once every six months has very little need for a lightning-fast response time.

### Customize this section of the template to give examples of the speed requirements that are important within your environment.

## 12b. Safety-Critical Requirements

* Content

### Quantification of the perceived risk of damage to people, property, and environment. Different countries have different standards, so the fit criteria must specify precisely which standards the product must meet.

* Motivation

### To understand and highlight the damage that could potentially occur when using the product within the expected operational environment.

* Examples

The product shall not emit noxious gases that damage people’s health.

The heat exchanger shall be shielded from human contact.

* Fit Criterion

The product shall be certified to comply with the Health Department’s standard E110-98. It is to be certified by qualified testing engineers.

No member of a test panel of [specified size] shall be able to touch the heat exchanger. The heat exchanger must also comply with safety standard [specify which one].

* Considerations

### The example requirements given here apply to some, but not all, products. It is not possible to give examples of every variation of safety-critical requirement. To make the template work in your environment, you should customize it by adding examples that are specific to your products.

### Also, be aware that different countries have different safety standards and laws relating to safety. If you plan to sell your product internationally, you must be aware of these laws. A colleague has suggested that for electrical products, if you follow the German standards, the largest number of countries will be supported.

### If you are building safety-critical systems, then the relevant safety-critical standards are already well specified. You will likely have safety experts on your staff. These experts are the best source of the relevant safety-critical requirements for your type of product. They will almost certainly have copious information that you can use.

### Consult your legal department. Members of this department will be aware of the kinds of lawsuits that have resulted from product safety failure. This is probably the best starting place for generating relevant safety requirements.

## 12c. Precision or Accuracy Requirements

* Content

### Quantification of the desired accuracy of the results produced by the product.

* Motivation

### To set the client’s and users’ expectations for the precision of the product.

* Examples

All monetary amounts shall be accurate to two decimal places.

Accuracy of road temperature readings shall be within ±2°C.

* Considerations

### If you have done any detailed work on definitions, then some precision requirements might be adequately defined by definitions in the dictionary in section 7.

### You might consider which units the product is intended to use. Readers will recall the spacecraft that crashed on Mars when coordinates were sent as metric data rather than imperial data.

### The product might also need to keep accurate time, be synchronized with a time server, or work in UTC.

### Also, be aware that some currencies have no decimal places, such as the Japanese yen.

## 12d. Reliability and Availability Requirements

* Content

### This section quantifies the necessary reliability of the product. The reliability is usually expressed as the allowable time between failures, or the total allowable failure rate.

### This section also quantifies the expected availability of the product.

* Motivation

### It is critical for some products not to fail too often. This section allows you to explore the possibility of failure and to specify realistic levels of service. It also gives you the opportunity to set the client’s and users’ expectations about the amount of time that the product will be available for use.

* Examples

The product shall be available for use 24 hours per day, 365 days per year.

The product shall be available for use between the hours of 8:00 a.m. and 5:30 p.m.

The escalator shall run from 6 a.m. until 10 p.m. or until the last flight arrives.

The product shall achieve 99 per cent uptime.

* Considerations

### Consider carefully whether the real requirement for your product is that it is available for use or that it does not fail at any time.

### Consider also the cost of reliability and availability, and whether it is justified for your product.

## 12e. Robustness or Fault-Tolerance Requirements

* Content

### Robustness specifies the ability of the product to continue to function under abnormal circumstances.

* Motivation

### To ensure that the product is able to provide some or all of its services after or during some abnormal happening in its environment.

* Examples

The product shall continue to operate in local mode whenever it loses its link to the central server.

The product shall provide 10 minutes of emergency operation should it become disconnected from the electricity source.

* Considerations

### Abnormal happenings can almost be considered normal. Today’s products are so large and complex that there is a good chance that at any given time, one component will not be functioning correctly. Robustness requirements are intended to prevent total failure of the product.

### You could also consider disaster recovery in this section. This plan describes the ability of the product to re-establish acceptable performance after faults or abnormal happenings.

## 12f. Capacity Requirements

* Content

### This section specifies the volumes that the product must be able to deal with and the amount of data stored by the product.

* Motivation

### To ensure that the product is capable of processing the expected volumes.

* Examples

The product shall cater for 300 simultaneous users within the period from 9:00 a.m. to 11:00 a.m. Maximum loading at other periods will be 150 simultaneous users.

During a launch period, the product shall cater for a maximum of 20 people to be in the inner chamber.

* Fit Criterion

### In this case, the requirement description is quantified, and thus can be tested.

## 12g. Scalability or Extensibility Requirements

* Content

### This specifies the expected increases in size that the product must be able to handle. As a business grows (or is expected to grow), our software products must increase their capacities to cope with the new volumes.

* Motivation

### To ensure that the designers allow capacity for future growth.

* Examples

The product shall be capable of processing the existing 100,000 customers. This number is expected to grow to 500,000 customers within three years.

The product shall be able to process 50,000 transactions per hour within two years of its launch.

## 12h. Longevity Requirements

* Content

### This specifies the expected lifetime of the product.

* Motivation

### To ensure that the product is built based on an understanding of expected return on investment.

* Examples

The product shall be expected to operate within the defined maximum maintenance budget for a minimum of five years.

# 13. Operational and Environmental Requirements

## 13a. Expected Physical Environment

* Content

### This section specifies the physical environment in which the product will operate.

* Motivation

### To highlight conditions that might need special requirements, preparations, or training. These requirements ensure that the product is fit to be used in its intended environment.

* Examples

The product shall be used by a worker, standing up, outside in cold, rainy conditions.

The product shall be used in noisy conditions with a lot of dust.

The product shall be able to fit in a pocket or purse.

The product shall be usable in dim light.

The product shall not be louder than the existing noise level in the environment.

* Considerations

### The work environment: Is the product to operate in some unusual environment? Does this lead to special requirements? Also see section 11, Usability and Humanity Requirements.

## 13b. Wider Environment Requirements

* Content

### Any requirements that relate to greenness, conservation, recycling, global warming, saving the planet.

* Motivation

### To consider any aspects of the product that might have an effect on the wider environment. The variety of technology is growing all the time, and every new technology has the potential of damaging the environment. For example, consider the technologies we use to create, consume and store data, can you think of any potential damage to the environment? Can you identify a requirement to guard against that potential damage?

* Examples

The product shall conform to the established emission standards.

The product shall discourage unnecessary printing.

The product shall advise the user of electricity usage.

The product shall advise the traveller of the carbon footprint of his journey.

The product shall clearly communicate recycling options.

* Considerations

### People are becoming more aware of how easy it is to damage our environment and are coming to prefer products that help to minimise that damage.

### Look at your solution technology and identify anything that might damage the environment. Do not restrict yourself to IT technology. Consider everything in your solution space like machines, motorways, lightbulbs, chemicals, viruses. This is difficult as every new technology emphasises advantages but, at the introduction of something new, we often don’t know the long-term effects.

## 13c. Requirements for Interfacing with Adjacent Systems

* Content

### This section describes the requirements to interface with partner applications and/or devices that the product needs in order to successfully operate.

* Motivation

### Requirements for the interfaces to other applications often remain undiscovered until implementation time. Avoid a high degree of rework by discovering these requirements early.

* Examples

The products shall work on the last four releases of the five most popular browsers.

The new version of the spreadsheet must be able to access data from the previous two versions.

Our product must interface with the applications that run on the remote weather stations.

* Fit Criterion

### For each inter-application interface, specify the following elements:

● The data content

● The physical material content

● The medium that carries the interface

● The frequency

● The volume

● The trigger

● The standards/protocols that apply to the interface

## 13d. Productization Requirements

* Content

### Any requirements that are necessary to make the product into a distributable or saleable item. It is also appropriate to describe here the operations needed to install a software product successfully.

* Motivation

### To ensure that if work must be done to get the product out the door, then that work becomes part of the requirements. Also, to quantify the client’s and users’ expectations about the amount of time, money, and resources they will need to allocate to install the product.

* Examples

The product shall be distributed as a ZIP file.

The product shall be able to be installed by an untrained user without recourse to separately printed instructions.

The product shall be of a size such that it can fit on one CD.

* Considerations

### Some products have special needs to turn them into a saleable or usable product. You might consider that the product has to be protected such that only paid-up customers can access it.

### Ask questions of your marketing department to discover unstated assumptions that have been made about the specified environment and the customers’ expectations of how long installation will take and how much it will cost.

### Most commercial products have needs in this area.

## 13e. Release Requirements

* Content

### Specification of the intended release cycle for the product and the form that the release shall take.

* Motivation

### To make everyone aware of how often you intend to produce new releases of the product.

* Examples

The maintenance releases will be offered to end users once a year.

Each release shall not cause previous features to fail.

* Fit Criterion

### Description of the type of maintenance plus the amount of effort budgeted for it.

* Considerations

### Do you have any existing contractual commitments or maintenance agreements that might be affected by the new product?

## 13f. Backwards Compatibility Requirements

* Content

### Specification of what the product has to do to accommodate legacy versions of the product you are working on or other legacy products.

* Motivation

### To ensure that there are no nasty surprises when the product is released. This type of requirement acknowledges that you are not always operating in a green field environment.

* Examples

The product shall be able to process data from both the legacy customer database and the new CRM database.

* Considerations

### Check the work context model for any legacy adjacent systems, or indications that legacy systems are included in the work scope.

# 14. Maintainability and Support Requirements

## 14a. Maintenance Requirements

* Content

### A quantification of the time necessary to make specified changes to the product.

* Motivation

### To make everyone aware of the maintenance needs of the product.

* Examples

New MIS reports must be available within one working week of the date when the requirements are agreed upon.

A new weather station must be able to be added to the system overnight.

* Considerations

### There may be special requirements for maintainability, such as that the product must be able to be maintained by its end users or by developers who are not the original developers. These requirements have an effect on the way that the product is developed. In addition, there may be requirements for documentation or training.

## 14b. Supportability Requirements

* Content

### This specifies the level of support that the product requires. Support is often provided via a help desk. If people will provide support for the product, then that service is considered part of the product: Are there any requirements for that support? You might also build support into the product itself, in which case this section is the place to write those requirements.

* Motivation

### To ensure that the support aspect of the product is adequately specified.

* Considerations

### Consider the anticipated level of support, and what forms it might take and who might need that support. For example, a constraint might state that there is to be no printed manual. Alternatively, the product might need to be entirely self-supporting.

## 14c. Adaptability Requirements

* Content

### Description of other platforms or environments to which the product must be ported.

* Motivation

### To publicise the client’s and users’ expectations about the platforms and environments on and in which the product will be able to run.

* Examples

The product is expected to run under Windows 7 and Linux.

The product might eventually be sold in the Japanese market.

The product is designed to run in offices, but we intend to have a version running in restaurant kitchens.

* Fit Criterion

### Specification of system software on which the product must operate.

### Specification of future environments in which the product is expected to operate.

### Time allowed to make the transition.

* Considerations

### Question your marketing department to discover unstated assumptions that have been made about the portability of the product.

# 15. Security Requirements

## 15a. Access Requirements

* Content

### Specification of who is authorized to access to the product (both functionality and data), under what circumstances that access is granted, and to which parts of the product access is allowed.

* Motivation

### To understand the expectations for confidentiality aspects of the system.

* Examples

Only direct managers can see the personnel records of their staff.

Only holders of a current security clearance can enter the building.

* Fit Criterion

### System function name or system data name.

### User roles and/or names of people who have clearance to access specified data.

### User roles and/or names of people who have clearance to add, change, delete specified data.

* Considerations

### Is there any data that management considers to be sensitive? Is there any data that low-level users do not want management to have access to? Are there any processes that might cause damage or might be used for personal gain? Are there any people who should not have access to the system?

### Avoid stating how you would design a solution to the security requirements. For instance, don’t specify a password system. Your aim here is to identify the security requirement; the design will come from the requirement.

### Consider asking for help. Computer security is a highly specialized field, and one where improperly qualified people have no business. If your product has need of more than average security, we advise you to make use of a security consultant. Such consultants are not cheap, but the results of inadequate security can be even more expensive.

## 15b. Integrity Requirements

* Content

### Specification of the required integrity of databases and other files, and of the product itself.

* Motivation

### To understand the expectations for the integrity of the product’s data. To specify what the product will do to ensure its integrity in the case of an unwanted happening such as attack from the outside or unintentional misuse by an authorized user.

* Examples

The product shall prevent incorrect data from being introduced.

The product shall protect itself from intentional abuse.

* Considerations

### Organizations are relying more and more on their stored data. If this data should be come corrupt or incorrect—or disappear—then it could be a fatal blow to the organization. For example, almost half of small businesses go bankrupt after a fire destroys their computer systems. Integrity requirements are aimed at preventing complete loss, as well as corruption, of data and processes.

## 15c. Privacy Requirements

* Content

### Specification of what the product has to do to ensure the privacy of individuals about whom it stores information. The product must also ensure that all laws related to privacy of an individual’s data are observed.

* Motivation

### To ensure that the product complies with the law, and to protect the individual privacy of your customers. Few people today look kindly on organizations that do not observe their privacy.

* Examples

The product shall make its users aware of its information practices before collecting data from them.

The product shall notify customers of changes to its information policy.

The product shall reveal private information only in compliance with the organization’s information policy.

The product shall protect private information in accordance with the relevant privacy laws and the organization’s information policy.

* Considerations

### Privacy issues may well have legal implications, and you are advised to consult with your organization’s legal department about the requirements to be written in this section.

### Consider what notices you must issue to your customers before collecting their personal information. Also, do you have to do anything to keep customers aware that you hold their personal information?

### Customers must always be in a position to give or withhold consent when their private data is collected or stored. Similarly, customers should be able to view any private data and, where appropriate, correct or ask for correction of the data.

### Also consider the integrity and security of private data—for example, when you are storing credit card information.

### The General Data Protection Regulation (GDPR) requirements are covered in Section 17 – Legal Requirements.

## 15d. Audit Requirements

* Content

### Specification of what the product has to do (usually retain records) to permit the required audit checks.

* Motivation

### To build a system that complies with the appropriate audit rules.

* Considerations

### This section may have legal implications. You are advised to seek the approval of your organization’s auditors regarding what you write here.

### You should also consider whether the product should retain information on who has used it. The intention is to provide security such that a user may not later deny having used the product or participated in some form of transaction using the product.

## 15e. Immunity Requirements

* Content

### The requirements for what the product has to do to protect itself from infection by unauthorized or undesirable software programs, such as viruses, worms, malware, spyware and any other undesirable interference.

* Motivation

### To build a product that is as secure as possible from malicious interference.

* Considerations

### Each day brings more malevolence from the unknown, outside world. People buying software, or any other kind of product, expect that it can protect itself from outside interference.

# 16. Cultural Requirements

## 16a. Cultural Market Requirements

* Content

### This section contains requirements that are specific to the sociological factors that affect the acceptability of the product. If you are developing a product for foreign markets, then these requirements are particularly relevant.

* Motivation

### To bring out in the open requirements that are difficult to discover because they are outside the cultural experience of the developers.

* Examples

The product shall not be offensive to religious or ethnic groups.

The product shall be able to distinguish between French, Italian, and British road-numbering systems.

The product shall keep a record of public holidays for all countries in the European Union and for all states in the United States.

* Considerations

### Question whether the product is intended for a culture other than the one with which you are familiar. Ask whether people in other countries or in other types of organizations will use the product. Do these people have different habits, holidays, superstitions, or cultural norms that do not apply to your own culture? Are there colours, icons, measurement units or words that have different meanings in another cultural environment? If your reaction to a requirement is – that’s rather odd/unusual/weird then it’s likely you have a cultural requirement.

## 16b. Cultural Diversity and Inclusion Requirements

* Content

### This section contains requirements that are specific to the factors that affect the acceptability of the product in different groups in society. In today’s world there are many requirements for products that fit with personal choices, preferences and feelings. Bear in mind that some of these cultural diversity and inclusion requirements might also be legal requirements.

* Motivation

### To recognise requirements that are outside the sociological experience of the developers and to make products that fit effectively into different peoples’ daily lives without causing offence.

* Examples

The product shall allow the user to choose the preferred courtesy title or honorific.

The product shall recognise all genders as specified by current LGBT conventions.

The product shall recognise all marital statuses as defined by the current law of the land.

The product shall not request or store courtesy title, gender or marital status unless there is an agreed need for that information.

* Considerations

### Consider whether the product could cause offence by ignoring or contravening any personal sociological preferences or choices. There have been many additional cultural diversity requirements recognised in the last few years so you might need the help of cultural experts to discover the requirements that are related to your work.

# 17. Compliance Requirements

## 17b. Standards Compliance Requirements

* Content

### A statement specifying applicable standards and referencing detailed standards descriptions. This does not refer to the law of the land—think of it as an internal law imposed by your company or by your industry.

* Motivation

### To comply with standards so as to avoid later delays.

* Example

The product shall comply with MilSpec standards.

The product shall comply with insurance industry standards.

The product shall be developed according to the Prince 2 methodology.

* Fit Criterion

### The appropriate standard-keeper certifies that the standard has been adhered to.

* Considerations

### It is not always apparent that there are applicable standards because their existence is often taken for granted. Consider the following:

● Do any industry bodies have applicable standards?

● Does the industry have a code of practice, watchdog, or ombudsman?

● Are there any special development steps for this type of product?

# Project Issues

The following *sections 18-27* contain issues that must be faced if the requirements are to be met and the product to become a reality. These sections also connect the requirements with the project activities that discover and progress the requirements. If you are using a consistent language for communicating requirements, then project managers can use the requirements as input to steering the project. The Volere Requirements Knowledge Model (included with the download of the template) provides the basis for a requirements common language by identifying classes of requirements knowledge and the relationships between them. Each of the classes of knowledge is cross-referenced to sections in this requirements template.

# 18. Open Issues

### Issues that have been raised and do not yet have a conclusion.

* Content

### A statement of factors that are uncertain and might make significant difference to the product.

* Motivation

### To bring uncertainty out in the open and provide objective input to risk analysis.

* Examples

Our investigation into whether the new version of the processor will be suitable for our application is not yet complete.

The government is planning to change the rules about who is responsible for gritting the motorways, but we do not know what those changes might be.

The feasibility study to determine whether to use the Regional Weather Center’s online database is not yet complete. This issue affects how we should handle the weather data.

Planned changes to working hours for drivers may affect the way that trucks are scheduled and the length of the routes that drivers are permitted to travel. The changes are still in the proposal stage; details will be available by the end of the year

* Considerations

### When you are probing around the user’s business, questions often come to the surface, and they cannot for the moment be answered. Similarly, as you are gathering the requirements for a future product, it may well be that your stakeholders are unsure of how the work should be done in the future. Are there any issues that have come up from the requirements gathering that have not yet been resolved? Have you heard of any changes that might occur in the other organizations or systems on your context diagram? Are there any legislative changes that might affect your system? Are there any rumours about your hardware or software suppliers that might have an impact?

* Form

### A list of open issues containing:

• Issue Number

• Cross reference to affected requirements (Business Events, BUCs, PUCs, Atomic Requirements, Dictionary Definitions)

• Summary of the issue

• Stakeholders involved

• Action

• Resolution

# 19. Off-the-Shelf Solutions

This section looks at available solutions and summarizes their applicability to the requirements. This discussion is not intended to be a full feasibility study of the alternatives, but it should tell your client that you have considered some alternatives and determined how closely they match the requirements for the product.

## 19a. Ready-Made Products

* Content

### List of existing products that should be investigated as potential solutions. Reference any surveys that have been done on these products.

* Motivation

### To give consideration to whether a solution can be bought.

* Considerations

### Could you buy something that already exists or is about to become available? It may not be possible at this stage to make this determination with a lot of confidence, but any likely products should be listed here.

### Also consider whether some products must not be used.

## 19b. Reusable Components

* Content

### Description of the candidate components, either bought from outside or built by your company, which could be used by this project. List libraries that could be a source of components.

* Motivation

### Reuse rather than reinvention.

## 19c. Products That Can Be Copied

* Content

### List of other similar products or parts of products that you can legally copy or easily modify.

* Motivation

### Reuse rather than reinvention.

* Examples

Another electricity company has built a customer service system. Its hardware is different from ours, but we could buy its specification and cut our analysis effort by approximately 60 per cent.

* Considerations

### While a ready-made solution may not exist, perhaps something, in its essence, is similar enough that you could copy, and possibly modify, it to better effect than starting from scratch. This approach is potentially dangerous because it relies on the base system being of good quality.

### This question should always be answered. The act of answering it will force you to look at other existing solutions to similar problems.

* Form

### For each of 19a, 19b, and 19c, set out the alternatives that you think are suitable. If your findings are preliminary, then say so. It is useful to add approximate costs, availability, time to implement, and other factors that may have a bearing on the decision.

# 20. New Problems

## 20a. Effects on the Current Environment

* Content

### A description of how the new product will affect the current implementation environment. This section should also cover things that the new product should *not* do.

* Motivation

### The intention is to discover early any potential conflicts that might otherwise not be realized until implementation time.

* Examples

Any change to the scheduling system will affect the work of the engineers in the divisions and the work of the truck drivers.

* Considerations

### Is it possible that the new system might damage some existing system? Can people be displaced or otherwise affected by the new system?

* Form

### These issues require a study of the current environment. A model highlighting the effects of the change is a good way to make this information widely understandable.

## 20b. Effects on the Installed Systems

* Content

### Specification of the interfaces between new and existing systems.

* Motivation

### Very rarely is a new development intended to stand completely alone. Usually the new system must coexist with some older system. This question forces you to look carefully at the existing system, examining it for potential conflicts with the new development.

* Form

### A model identifying the interfaces between the new and existing systems supported by data dictionary definitions of the interfaces. The interfaces might also be supported by prototypes or sketches of format.

## 20c. Potential User Problems

* Content

### Details of any adverse reaction that might be suffered by existing users.

* Motivation

### Sometimes existing users are using a product in such a way that they will suffer ill effects from the new system or feature. Identify any likely adverse user reactions, and determine whether we care about those reactions and what precautions we will take.

## 20d. Limitations in the Anticipated Implementation Environment That May Inhibit the New Product

* Content

### Statement of any potential problems with the new automated technology or new ways of structuring the organization.

* Motivation

### The intention is to make early discovery of any potential conflicts that might otherwise not be realized until implementation time.

* Examples

The planned new server is not powerful enough to cope with our projected growth pattern.

The size and weight of the new product do not fit into the physical environment.

The power capabilities will not satisfy the new product’s projected consumption.

* Considerations

### This requires a study of the intended implementation environment.

## 20e. Follow-Up Problems

* Content

### Identification of situations that we might not be able to cope with.

* Motivation

### To guard against situations where the product might fail.

* Considerations

### Will we create a demand for our product that we are not able to service? Will the new system cause us to run afoul of laws that do not currently apply? Will the existing hardware cope?

### There are potentially hundreds of unwanted effects. It pays to answer this question very carefully.

# 21. Tasks

What steps have to be taken to deliver the product? This section highlights the effort required to build the product, the steps needed to buy a solution, the amount of effort to modify and install a ready-made solution, and so on.

## 21a. Project Planning

* Content

### Details of the life cycle and approach that will be used to deliver the product.

* Motivation

### To specify the approach that will be taken to deliver the product so that everyone has the same expectations.

* Considerations

### Depending on the maturity level of your process, the new product will be developed using your standard approach. However, some circumstances are unique to a particular product and will necessitate changes to your life cycle. While these considerations are not product requirements, they are needed if the product is to be successfully developed.

### If possible, attach an estimate of the time and resources needed for each task based on the requirements that you have specified. Attach your estimates to the events, use cases, and/or functional requirements that you specified in sections 6, 8 and 9.

### Do not forget issues related to data conversion, user training, and cutover. These needs are usually ignored when projects set implementation dates.

* Form

### A high-level process diagram or a task list showing the tasks and the interfaces between them is a good way to communicate this information. Here you can also identify the strategy that you intend to use to maximise your potential for agility.

## 21b. Planning of the Development Phases

* Content

### Specification of each phase of development and the components in the operating environment.

* Motivation

### To identify the phases necessary to implement the operating environment for the new system so that the implementation can be managed.

* Considerations

### Identify which hardware and other devices are necessary for each phase of the new system. This list may not be known at the time of the requirements process, as these devices may be decided at design time.

* Form

### This is usually a mixture of diagrams and text. For each phase of the project:

### Name of the phase.

### Value/benefit of delivery to user.

### Required operational date.

### Operating environment components included.

### Functional requirements included.

### Non-functional requirements included.

# 22. Migration to the New Product

When you install a new product, some things always have to be done before it can work successfully. For example, databases often have to be converted. There is usually new data to be collected, procedures to be converted, and many other steps to be taken to ensure the successful transition to the new product.

Often there are periods where the organization will run both the old product and the new product in parallel until the new one has proven that it is functioning correctly.

This section of the specification is where you identify the tasks necessary for the period of transition to the new product. This section is input to the project planning process.

## 22a. Requirements for Migration to the New Product

* Content

### A list of the conversion activities. Timetable for implementation.

* Motivation

### To identify conversion tasks as input to the project planning process.

* Considerations

### Will you use a phased implementation to install the new system? If so, describe which requirements will be implemented by each of the major phases.

### What kind of data conversion is necessary? Must special programs be written to transport data from an existing system to the new one? If so, describe the requirements for these programs here.

### What kind of manual backup is needed while the new system is installed?

### When are each of the major components to be put in place? When are the phases of the implementation to be released?

### Is there a need to run the new product in parallel with the existing product?

### Will we need additional or different staff?

### Is any special effort needed to decommission the old product?

### This section is the timetable for implementation of the new system.

* Form

### A cross-reference between the development tasks, your project phases and the Product Use Cases and Atomic Requirements.

## 22b. Data That Has to Be Modified or Translated for the New Product

* Content

### List of data translation tasks.

* Motivation

### To discover missing tasks that will affect the size and boundaries of the project.

* Considerations

### Every time you make an addition to your dictionary (see section 7), ask this question: Where is this data currently held, and will the new system affect that implementation?

* Form

### Description of the current technology that holds the data.

### Description of the new technology that will hold the data.

### Description of the data translation tasks.

### Foreseeable problems.

# 23. Risks

All projects involve risk—namely, the risk that something will go wrong. Risk is not necessarily a bad thing, as no progress is made without taking some risk. Risk is only a bad thing if the risks are ignored and they become problems. Risk management entails assessing which risks are most likely to apply to the project, deciding a course of action if they become problems, and monitoring projects to give early warnings of risks becoming problems.

* Content

### This section of the specification contains a list of the most likely and the most serious risks for your project. For each risk, include the probability of it becoming a problem and any contingency plans.

* Motivation

### To discover and manage the risks.

* Considerations

### Risks will undoubtedly change during the lifetime of a project. The better you understand the requirements the better you can identify which risks are most serious for your project. The project manager determines how to manage the risks but the requirements specialists and developers provide input on new risks and which risks are turning into problems.

### Use your knowledge of the requirements as input to discover which risks are most relevant to your project. Use the Volere Requirements Knowledge Model (included with the download of the template) as a trigger for identifying relevant risks.

### It is also useful input to project management if you include the impact on the schedule, and/or the cost, if the risk does become a problem.

### As an alternative, you may prefer to identify the single largest risk—the showstopper. If this risk becomes a problem, then the project will definitely fail. Identifying a single risk in this way focuses attention on the single most critical area. Project efforts are then concentrated on not letting this risk become a problem.

### This section is not intended to be a thorough treatise on risk management. Nor is this section meant to be a substitute for proper risk management. The intention here is to assign risks to requirements and show clearly that requirements are not free—they carry a cost that can be expressed as an amount of money or time, and as a risk. Later, you can use this information if you need to make choices about which requirements should be given a higher priority.

* Form

### A risk list or log. Risk models as defined in: DeMarco, Tom, and Timothy Lister. *Waltzing with Bears: Managing Risk on Software Projects.* Dorset House, 2003.

### For each risk, include the probability of that risk becoming a problem. Capers Jones’s *Assessment and Control of Software Risks* (Prentice-Hall, Englewood Cliffs, N.J., 1994) gives comprehensive lists of risks and their probabilities; you can use these lists as a starting point. For example, Jones cites the following risks as being the most serious:

• Inaccurate metrics

• Inadequate measurement

• Excessive schedule pressure

• Management malpractice

• Inaccurate cost estimating

• Silver bullet syndrome

• Creeping user requirements

• Low quality

• Low productivity

• Cancelled projects

# 24. Costs

### The other cost of requirements is the amount of money or effort that you have to spend building them into a product. Once the requirements specification is complete, you can use one of the estimating methods to assess the cost, expressing the result as a monetary amount or time to build.

### There is no best method to use when estimating. The important thing is to create your estimates using metrics directly related to the requirements. If you have specified the requirements in the way we have described, you will have the following metrics:

● Number of input and output flows on the work context

● Number of business events

● Number of product use cases

● Number of functional requirements

● Number of non-functional requirements

● Number of requirements constraints

● Number of function points

### The more detailed the work you do on your requirements, the more accurate your estimates will be. Your cost estimate is the amount of resources you estimate each type of deliverable will take to produce within your environment. You can create some very early cost estimates based on the work context. At that stage, your knowledge of the work will be general, and you should reflect this vagueness by making the cost estimate a range rather than a single figure. You can use these metrics as the basis for estimating the time, effort, and cost of building the product. First you need to determine what each of these metrics means within the environment in which you are building the product. For example, do you know how long it will take you to do all the work necessary to implement a product use case? If you do not, then you can take one of the use cases and benchmark it.

### As you increase your knowledge of the requirements, we suggest you try using function point counting—not because it is an inherently superior method, but because it is so widely accepted. So much is known about function point counting that it is possible to make easy comparisons with other products and other installations’ productivity. For details on how to estimate requirements effort and costs, refer to *Mastering the Requirements Process,* Addison Wesley, 2013. Appendix C Function Point Counting: A Simplified Introduction

### It is important that your client be told at this stage what the product is likely to cost. You usually express this amount as the total cost to complete the product, but you may also find it advantageous to point out the cost of the requirements effort, or the costs of individual requirements.

### Whatever you do, do not leave the costs in the lap of hysterical optimism. Make sure that this section includes meaningful numbers based on tangible deliverables.

# 25. User Documentation and Training

This section specifies the user documentation that will be produced as part of the product-building effort. This is not the documentation itself, but a description of what must be produced. The reason for including this description is to establish your client’s expectations, and to give your usability people and your users the chance to assess whether the proposed documentation will be sufficient.

## 25a. User Documentation Requirements

### This section defines the user documentation to be supplied with the Breadfast CRM system. The content for this documentation will be derived directly from the functional requirements, product use cases, and data dictionary defined in this specification.

### List of Documentation Deliverables

| Document Title | Purpose & Audience | Format | Owner / Author | Maintenance Responsibility |
| --- | --- | --- | --- | --- |
| CRM Administrator Guide | Purpose: To enable System Administrators to install, configure, and maintain the CRM system. Audience: IT Staff, System Administrators. | Online Help Portal (PDF exportable) | Project Implementation Team | CRM Support Team |
| End-User Quick Start Guide | Purpose: To provide new users with a fast-track introduction to core daily tasks. Audience: All internal users (Agents, Dispatchers, Managers). | PDF Handbook & Intranet Web Pages | Project Implementation Team | Departmental "CRM Champions" |
| Role-Based User Manuals | Purpose: To provide detailed, task-oriented instructions specific to each user role. Audience: Customer Support Agents, Sales Team, Inventory Managers, Delivery Dispatchers. | Online Help Portal (context-sensitive) | Business Analysts & Super Users | Departmental "CRM Champions" |
| Rider Delivery App Guide | Purpose: To instruct delivery riders on how to use the mobile interface for order pickup, delivery, and status updates. Audience: Delivery Riders. | Mobile-friendly Web Guide & Laminated Quick Reference Card | Project Implementation Team | Logistics / Dispatch Manager |
| API Technical Specification | Purpose: To enable technical teams to integrate the CRM with external systems (e.g., Payment Gateway, SMS services). Audience: Developers, System Integrators. | Online API Documentation (e.g., Swagger/OpenAPI) | Development Team | Development Team |

### Content Sources and Development Approach

### The documentation will not be created from scratch but will leverage existing project artifacts to ensure consistency and accuracy:

### Use Case-Driven Task Flows: The core of the Role-Based User Manuals will be the Product Use Cases (PUCs). Each PUC will be transformed into a step-by-step procedural guide with screenshots. For example, the "Retrieve Customer Information" use case will become a section titled "How to Find a Customer Profile."

### Glossary and Data Dictionary: All documentation will use the definitions and terms established in the project's Data Dictionary (Section 7b) to ensure consistent terminology across all user-facing materials.

### Functional Requirements as Feature Descriptions: The Atomic Functional Requirements (Section 9a) will serve as the basis for describing specific system capabilities and their acceptance criteria within the Administrator Guide and Technical Specifications.

### Interface Prototypes: Screenshots and walkthroughs from the approved UI/UX prototypes will be used to illustrate the user manuals, providing users with an accurate preview of the system.

### Maintenance and Update Process

### Initial Creation: The Project Implementation Team (Business Analysts and Technical Writers) will be responsible for the initial authoring of all documents.

### Review: Drafts will be reviewed by the designated "CRM Champions" from each department for accuracy and usability.

### Updates: Documentation will be updated as part of the standard change management process. Any change request that modifies functionality must include a requirement to update the relevant documentation.

### Publication: The primary source for all documentation will be the online help portal, which will be versioned alongside the software releases.

## 25b. Training Requirements

* Target Audiences & Training Tracks
* Training will be role-based, corresponding to the system's actors and their defined use cases.
* 1. Customer Support Agents
* Focus: Customer Management, Complaint Resolution, and Real-Time Communication.
* Key Training Modules:
  + Navigating the Customer 360 View: How to search for customers and interpret the unified profile, including personal details, order history, and complaint records.
  + Managing Customer Information: Procedures for updating authorized customer fields, with emphasis on audit trails (timestamp, agent ID).
  + Complaint Lifecycle Management: How to create, update, track status, and resolve complaint tickets. Training on interpreting and responding to SLA breach alerts.
  + Using the Integrated Messaging Hub: Sending, receiving, and replying to customer messages within the CRM dashboard.
  + Providing Real-Time Order Updates: How to use the system to check and communicate accurate order status and delivery information to customers.
* Format: Instructor-led hands-on labs, using realistic scenario-based exercises.
* 2. Sales & Marketing Team
* Focus: Analytics Dashboard and Customer Segmentation.
* Key Training Modules:
  + Interpreting the Sales Dashboard: Understanding key metrics (total revenue, average order value, top/low-performing products) and how to filter data by category, date, and region.
  + Generating and Using Analytical Reports: Running pre-defined reports and creating custom reports for sales performance analysis.
  + Leveraging Customer Segmentation: How to create, manage, and apply dynamic customer segments based on purchase behavior and spending patterns for targeted campaigns.
* Format: Workshop-style sessions focused on data interpretation and strategic application.
* 3. Inventory & Purchasing Staff
* Focus: Inventory & Supplier Management.
* Key Training Modules:
  + Monitoring Real-Time Stock Levels: Understanding the inventory dashboard, product statuses (In Stock, Low, Out of Stock), and reorder thresholds.
  + Responding to Low-Stock Alerts: Process for acknowledging alerts and initiating the restocking procedure.
  + Supplier Management: How to add, edit, and archive supplier records, ensuring data accuracy across linked purchase orders.
  + Purchase Order and Restocking Workflow: Creating purchase orders and recording received stock against them.
  + Performing Manual Stock Adjustments: Procedures for correcting inventory counts due to damage, loss, or counting errors.
* Format: Hands-on procedural training.
* 4. Delivery Dispatchers & Managers
* Focus: Delivery & Dispatch Management.
* Key Training Modules:
  + Using the Dispatch Interface: How to monitor rider progress on a live map, assign orders to riders, and understand delivery statuses.
  + Managing Delivery Exceptions: Responding to automated alerts for delayed or failed deliveries.
  + Interpreting Performance Reports: How to access and analyze weekly delivery performance reports and rider metrics.
* Format: Simulation-based training using a live test environment.
* 5. System Administrators
* Focus: User Management and System Configuration.
* Key Training Modules:
  + Role-Based Access Control (RBAC): Creating and modifying user roles, and assigning precise permissions based on operational needs.
  + User Account Lifecycle Management: Procedures for adding, modifying, and deactivating user accounts.
  + Basic System Monitoring and Troubleshooting.
* Format: Advanced technical training, potentially provided by the software vendor or lead implementation partner.
* Training Development & Delivery Responsibility
* Training Design & Material Creation: The Project Implementation Team (comprising Business Analysts and Lead Developers) will be responsible for creating all training curricula, user manuals, quick-reference guides, and digital training modules. These materials will directly utilize the use case scenarios and glossary defined in this requirements specification.
* Training Provision: A train-the-trainer model will be used. The Project Implementation Team will first train a group of "CRM Champions" or Super Users from each department. These Super Users will then be primarily responsible for delivering the role-based training to their respective teams.
* Training Sessions: Training will be scheduled in phases during the weeks leading up to the system go-live date. Sessions will be held in dedicated training rooms and/or via virtual classroom software. Recordings and materials will be made available on the company's internal knowledge base for refresher training and onboarding of new employees.
* Success Metrics
* Training effectiveness will be measured through:
* Post-training proficiency assessments (quizzes/practical tests).
* Monitoring help-desk ticket volume related to "how-to" questions in the first 30 days post-launch.
* Feedback surveys from trainees on the clarity and usefulness of the training.

# 26. Waiting Room

* This section contains requirements that have been identified and documented but are not planned for the initial release (Version 1.0) of the Breadfast CRM. These items form the analysis backlog for future iterations and will be prioritized for subsequent releases based on business value, implementation cost, and strategic alignment.

### Waiting Room Items

| Description | Type | Proposed Version | Priority | Justification & Notes |
| --- | --- | --- | --- | --- |
| AI-Powered Response Suggestions | Functional | V 3.0 | Medium | Use NLP to analyze incoming customer messages and suggest context-aware responses to agents. Benefit: Reduces agent response time for complex queries. Cost: High (AI integration, training data). |
| Predictive Demand Forecasting | Functional | v2.0 | High | System predicts future product demand using machine learning based on sales history, trends, and seasonality. Benefit: Optimizes inventory, reduces waste. Cost: High. |
| Customer Loyalty & Rewards Program | Functional | v1.5 | High | Integrate a points-based loyalty system where customers earn and redeem points on orders. Benefit: Increases customer retention and frequency. Cost: Medium. |
| Advanced Order Scheduling | Functional | v1.5 | Medium | Allow customers to schedule orders for a specific future date and time (e.g., "deliver Sunday morning"). Benefit: Improves customer convenience. Cost: Medium (complexity in dispatch scheduling). |
| Dynamic Delivery Routing | Functional | v2.0 | Medium | Automatically calculate and suggest the most efficient delivery route for a rider with multiple orders. Benefit: Reduces fuel costs and improves delivery times. Cost: High (requires advanced mapping API integration). |
| Two-Factor Authentication (2FA) | Non-Functional | v1.5 | Medium | Require 2FA for all employee logins to the CRM system. Benefit: Enhances security for sensitive customer data. Cost: Low. |
| Advanced ERP Integration | Functional | v2.0 | Low | Deep integration with financial/accounting software (e.g., Xero, QuickBooks) for automated ledger posting. Benefit: Reduces manual accounting work. Cost: High. |
| Customer Health Score Dashboard | Functional | v2.0 | Low | Calculate and display a visual "health score" for each customer based on activity, spending trends, and support tickets. Benefit: Proactive churn prediction. Cost: Medium. |
| Voice-Enabled Analytics | Functional | Future | Low | Allow managers to ask verbal questions to the analytics dashboard (e.g., "What were sales for baklava last week?"). Benefit: Hands-free, rapid data access. Cost: Very High (R&D project). |
| Dedicated Rider Mobile App | Functional | v1.5 | High | Replace the generic mobile interface with a purpose-built, offline-capable mobile application for delivery riders. Benefit: Improved usability and reliability in areas with poor connectivity. Cost: Medium. |

# 27. Ideas for Solutions

1. Automated Low-Stock Procurement Workflow

* Idea: When a "Generate Low-Stock Alert" is triggered, the system could automatically create a draft Purchase Order in the system, pre-populated with the supplier and product details. The purchasing officer would then only need to review, adjust quantities if necessary, and confirm, rather than starting from scratch.
* Rationale: Streamlines the inventory restocking process, reduces manual data entry, and helps prevent human error, leading to faster restocking.

1. Rider Assignment "Heatmap" Interface

* Idea: For the delivery dispatcher, provide a map-based interface showing real-time rider locations as icons. Orders ready for dispatch could appear as pins. The system could suggest optimal assignments based on proximity, which the dispatcher can then confirm or override with a drag-and-drop action.
* Rationale: Provides an intuitive, visual method for assigning orders that is faster and more efficient than a list-based interface, directly supporting the goal of "efficient" delivery.

1. Proactive "360 View" Context Cards

* Idea: Within the established Customer 360 View, implement smart "Context Cards" that automatically highlight relevant information when an agent opens a profile. For example:
  + A "High-Value Customer" card could be pinned to the top if the customer is in a top spending segment.
  + An "Active Complaint" card could appear if a ticket is still open, showing its status and SLA countdown.
  + A "Recent Delivery Issue" card could flag a customer whose last order was delayed or failed.
* Rationale: Moves beyond a passive data display to an intelligent, proactive interface that helps agents immediately understand the context and priority of the interaction, speeding up resolution.