

Vacation Management System

Software Requirements Specification

Version 2.1

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Prepared for: Ejada

Prepared by: Omar Abdelrahman Abbas

Under supervision of: Ahmed Abdelwahab Mohamed

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1 Introduction

1.1 Purpose

This Software Requirements Specification (SRS) document describes the functional and non-functional requirements for the Vacation Management System. The document serves as a comprehensive contract between the development team and stakeholders, providing a detailed understanding of what the system must accomplish based on the complete project scope and use cases.

1.2 Scope

The Vacation Management System is designed to automate the vacation request, approval, and cancellation processes while providing robust reporting capabilities for efficient vacation management. The system addresses inefficiencies in the current paper-based system, such as processing delays and inaccurate balance tracking due to manual errors and duplicate records.

The system scope includes:

- Employee vacation request submission and management
- Vacation cancellation request processing
- Multi-level approval workflow (Employee → Manager → HR → General Manager)
- Vacation inquiry and search functionality
- Report generation (Single Transaction and Comparative Annual Reports)
- Automated vacation balance management
- Notification system for all stakeholders

1.3 Definitions, Acronyms, and Abbreviations

- **HR:** Human Resources
- **SRS:** Software Requirements Specification
- **UI:** User Interface
- **PDF:** Portable Document Format
- **API:** Application Programming Interface
- **DB:** Database
- **UC:** Use Case
- **GM:** General Manager
- **ERD:** Entity Relationship Diagram

1.4 References

- Project Scope Document

- All-UseCases.json - Complete Use Case Specifications
- Wireframe Specifications (see Appendix C)
- Data Dictionary Documentation (see Appendix B.2)
- System Diagrams (Context, State, Workflow)

1.5 Overview

The remainder of this document is organized as follows:

- Section 2: Overall Description
- Section 3: System Architecture and Context
- Section 4: Business Rules and Logic
- Section 5: User Requirements / Use Cases
- Section 6: Functional Requirements
- Section 7: Non-Functional Requirements
- Section 8: User Interface Overview
- Section 9: Data Requirements Overview
- Section 10: System Messages
- Section 11: Appendices
- Section 12: Document Approval

2 Overall Description

2.1 Product Perspective

The Vacation Management System is a web-based application with mobile support that integrates with existing HR systems. It operates as a standalone module that can be deployed independently or integrated with larger enterprise systems.

2.2 Product Functions

The system provides the following core functionalities:

1. Vacation Request Management

- Create vacation requests (Annual and Sick leave types)
- File attachment capabilities (mandatory for sick leave)
- Real-time validation and balance checking
- No modification capability after submission

2. Vacation Cancellation Management

- Cancel pending or approved requests before start date
- Cancellation reason tracking

- Approval workflow for cancellations

3. Approval Workflow

- Multi-level approval process (Employee → Manager → HR → GM)
- Automatic escalation after 2 days of delay
- Manager and HR review capabilities

4. Reporting and Analytics

- Single transaction reports (PDF)
- Comparative annual reports by department
- Department-wise vacation analytics

5. Inquiry and Search

- Advanced search capabilities with multiple filters
- Export functionality to Excel
- Pagination and result management

6. Automated Balance Management

- Automatic vacation balance calculation
- Entitlement rules (21/30 days based on service/age)
- No manual overrides permitted

7. Notification System

- Real-time notifications for all stakeholders
- Context-aware notification types
- Quick navigation to related screens

2.3 User Classes and Characteristics

User Class	Characteristics	Access Rights
Employees	Full-time Muslim Saudi employees, non-trainees	Submit requests, view own requests, cancel requests
Direct Managers	Supervisors, approve subordinate requests	Review, approve/reject requests, view team reports
HR Personnel	Administrative users, manage policies	Full access, policy management, all reports
General Managers	Senior management, final approval	Final approval, all reports access, system oversight
System Administrators	Technical users, system maintenance	Full system access, configuration management

Table 1: User Classes and Access Rights

2.4 Stakeholder Register

Stakeholder	Role / Title	Power	Interest	Key Requirements	Main Concerns
Employees	Staff	L	H	Submit and track vacation requests	Rejections, delays, unclear process
Direct Managers	Supervisor	H	H	Approve/reject requests	Delays, incomplete information
HR Personnel	HR Officer	H	H	Manage policies, approve requests	Misuse, balance errors
General Managers	GM / Senior Manager	H	H	Final approvals, system oversight	Delayed approvals, wrong balances
System	Automated Actor	H	H	Update balances, enforce policies	Wrong calculations, workflow errors

Table 2: Stakeholder Register

2.5 Operating Environment

- **Platform:** Web-based application with mobile responsive design
- **Browsers:** Chrome, Firefox, Safari, Edge (latest versions)
- **Mobile:** iOS 12+, Android 8+
- **Database:** SQL Server/MySQL/PostgreSQL
- **Server:** Windows/Linux server environment

2.6 Design and Implementation Constraints

- Compliance with Saudi vacation regulations
- Integration with existing HR systems
- Support for Arabic and English languages
- Mobile-first responsive design
- PDF generation capabilities
- Real-time notifications
- No modification of submitted requests

2.7 Assumptions and Dependencies

- Existing employee database is available
- Network infrastructure supports web access
- Users have basic computer literacy
- HR policies are well-defined and documented
- Integration APIs are available for external systems
- All employees are full-time Muslim Saudi employees

3 System Architecture and Context

3.1 System Context Diagram

The Vacation Management System operates within a broader organizational context, interacting with various stakeholders and external systems. The following diagram shows how the system integrates with the broader organizational ecosystem:

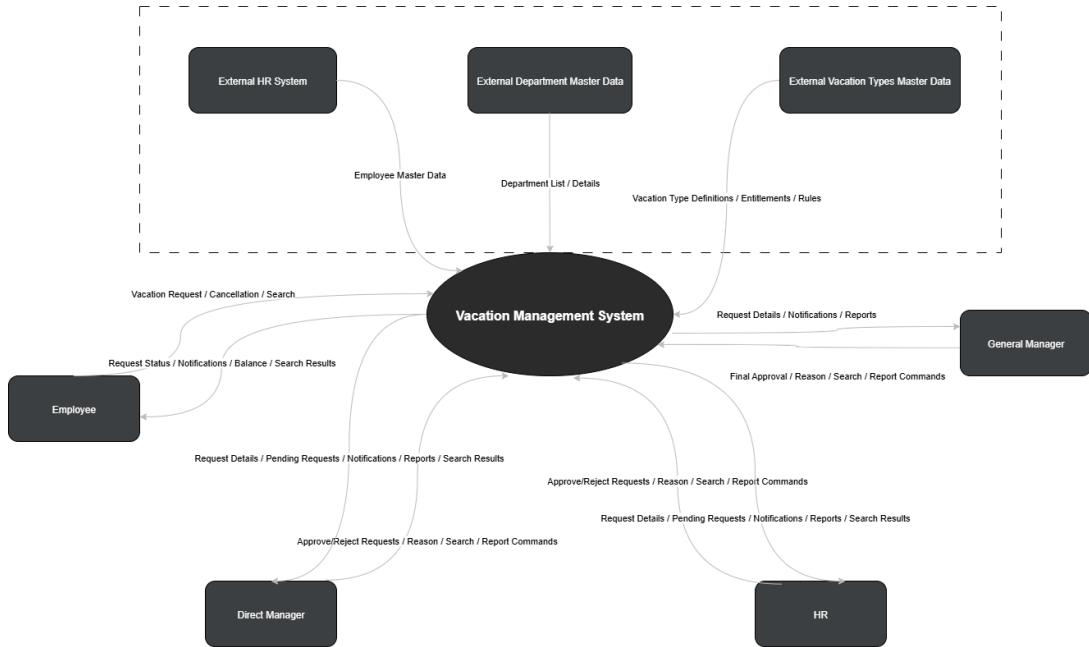


Figure 1: System Context Diagram - Vacation Management System Integration

3.2 System Architecture Overview

The system follows a three-tier architecture designed for scalability and maintainability:

- **Presentation Tier:** Web and mobile interfaces with responsive design
- **Business Logic Tier:** Application services, workflows, and business rules engine
- **Data Tier:** Database, file storage, and integration services

3.3 Core System Components

The system is built around these key components:

- **User Management Module:** Authentication, authorization, and role-based access control
- **Vacation Management Module:** Core business logic for request processing
- **Workflow Engine:** Multi-level approval process management with escalation
- **Reporting Module:** PDF generation and data export capabilities
- **Notification Module:** Real-time communication and alert system
- **Balance Management Module:** Automated vacation balance calculations

3.4 System State Management

The system manages various states for vacation requests and the overall workflow. The following state diagram illustrates the complete lifecycle of a vacation request:

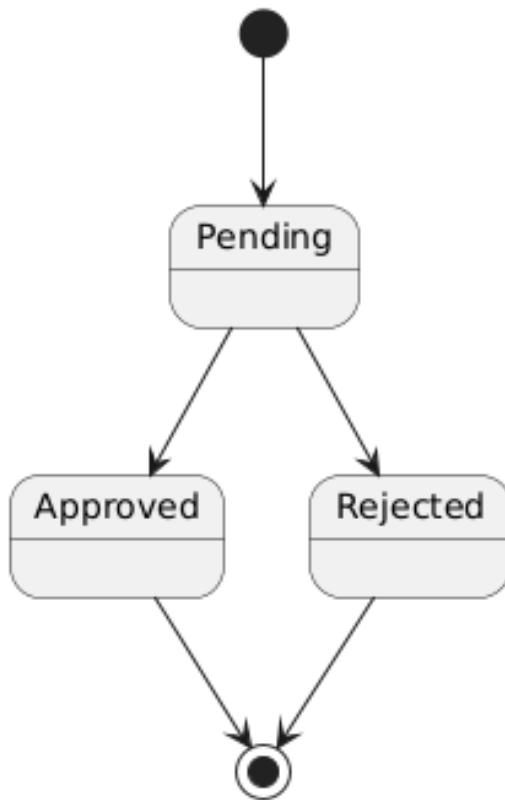
Vacation Request - State Diagram

Figure 2: Vacation Request State Diagram - Complete Request Lifecycle

3.5 Core Workflow Processes

The system implements several key workflow processes that define the approval and processing logic:

3.5.1 Basic Vacation Request Flow

The standard vacation request follows this workflow:

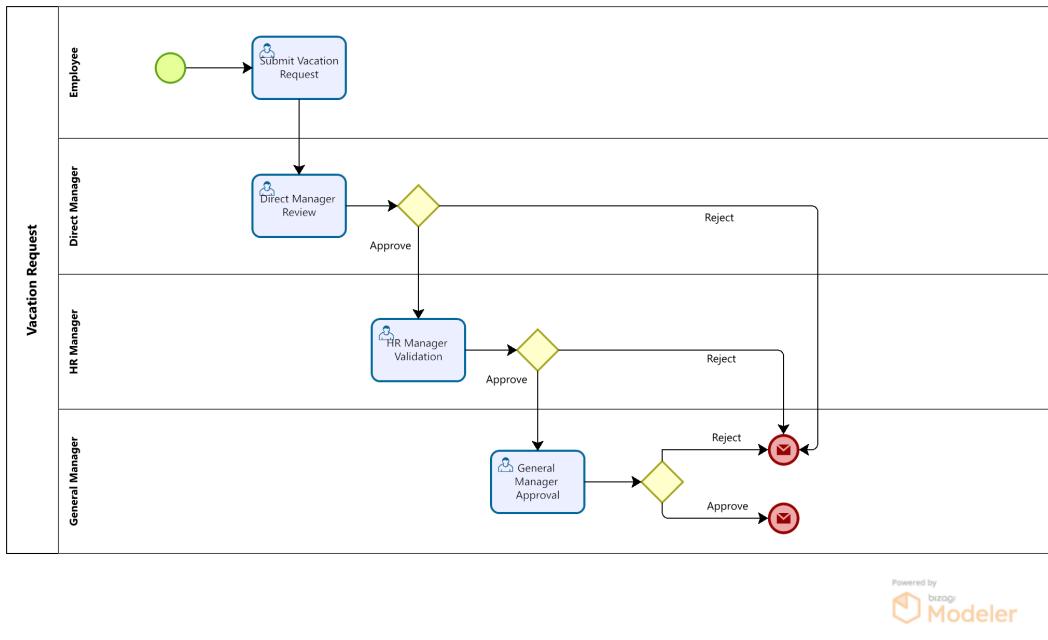
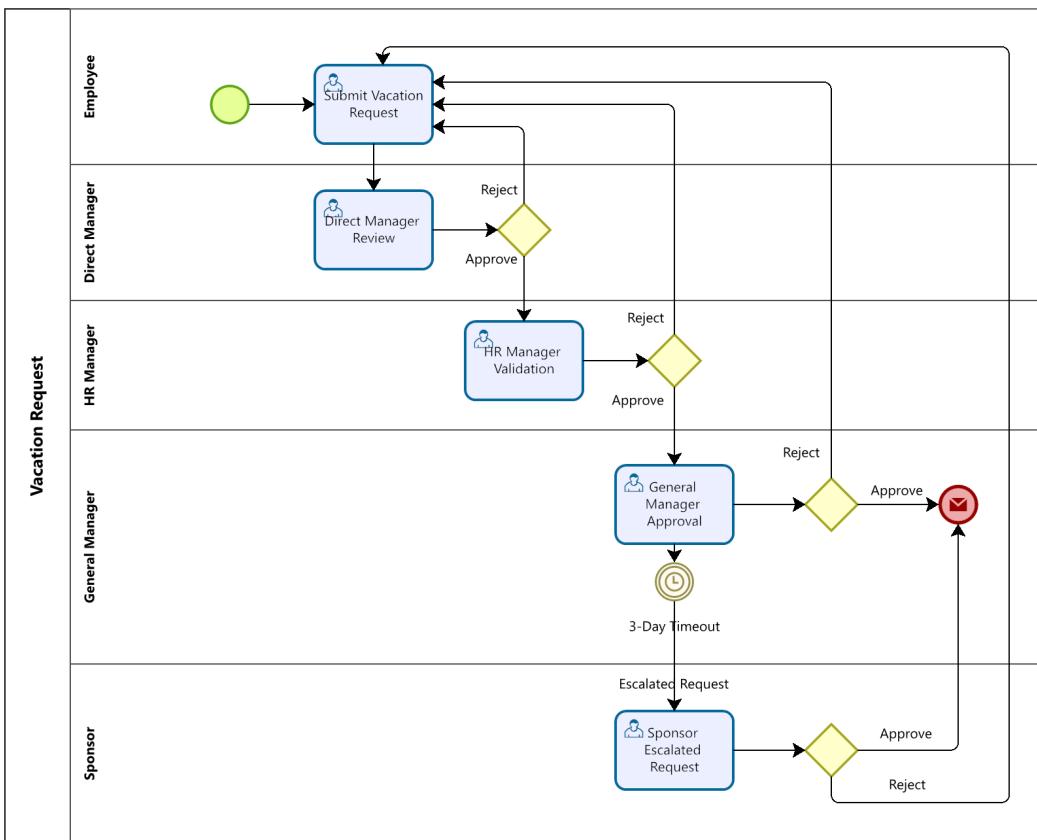


Figure 3: Basic Vacation Request Workflow - Standard Approval Process

3.5.2 Escalation to Sponsor Flow

When approvals are delayed, the system automatically escalates requests:



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Figure 4: Vacation Request Escalation to Sponsor Workflow - Automatic Escalation

3.5.3 Resubmission After Rejection Flow

Rejected requests can be resubmitted following this process:

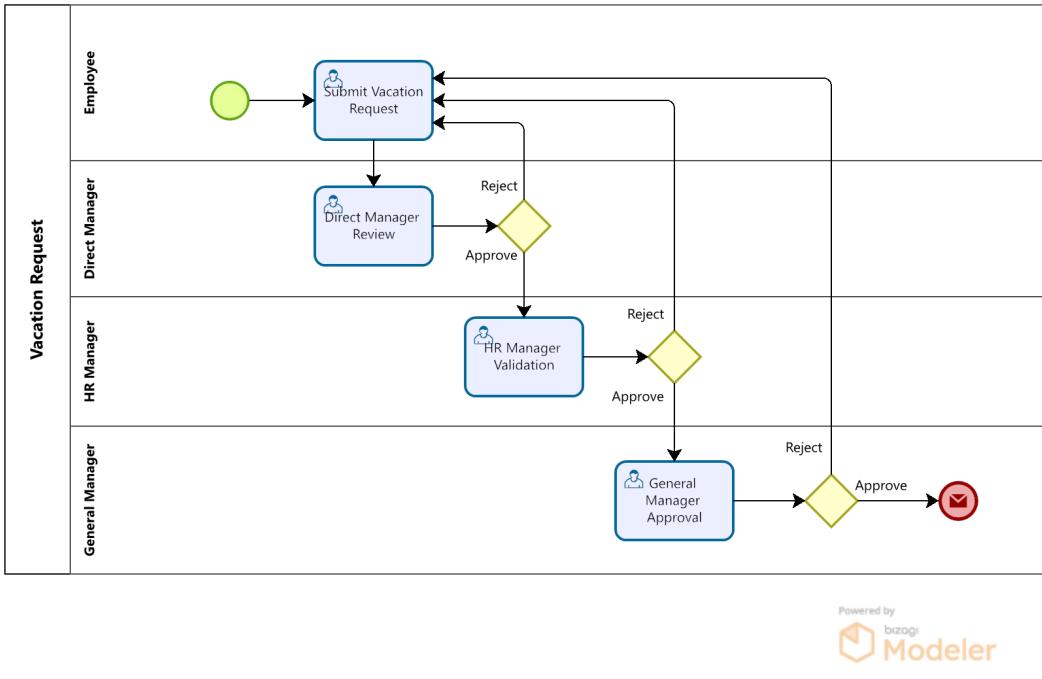


Figure 5: Vacation Request Resubmission After Rejection Workflow

4 Business Rules and Logic

This section is the single source of truth for all business rules that govern system behavior. Use cases and functional requirements must reference rules here by ID (e.g., BR-011). If any use case introduces a new rule, it must be added here and assigned a unique identifier.

4.1 Vacation Policy Rules

4.1.1 BR-001: Annual Entitlement

Rule: Standard annual vacation entitlement is 21 days per year. **Applicable Use Cases:** UC-1, UC-12 **Implementation:** System automatically allocates 21 days at the start of each calendar year.

4.1.2 BR-002: Extended Entitlement

Rule: Employees with 10+ years of service OR age ≥ 50 receive 30 days annual entitlement. **Applicable Use Cases:** UC-1, UC-12 **Implementation:** System evaluates hire date and birth date from Employee Master Data to determine eligibility.

4.1.3 BR-003: Leave Types

Rule: System supports only Annual and Sick leave types. **Applicable Use Cases:** UC-1, UC-4, UC-5 **Implementation:** Vacation Types Master Data defines these two types exclusively.

4.1.4 BR-004: Unused Days Policy

Rule: Unused vacation days are forfeited annually with no carryover or compensation. **Applicable Use Cases:** UC-12 **Implementation:** System resets balance to annual entitlement at year-end without preserving unused days.

4.1.5 BR-005: Trainee Restrictions

Rule: Trainees cannot submit vacation requests. **Applicable Use Cases:** UC-1 **Implementation:** System checks employee status from Employee Master Data and blocks request submission for trainees.

4.2 Approval Workflow Rules

4.2.1 BR-006: Approval Hierarchy

Rule: Vacation requests follow the sequence: Employee → Direct Manager → HR → General Manager. **Applicable Use Cases:** UC-1, UC-4, UC-6 **Implementation:** System routes requests through predefined approval levels with role-based access control.

4.2.2 BR-007: Escalation Policy

Rule: Requests automatically escalate to the next level after 2 days of inaction. **Applicable Use Cases:** UC-4, UC-6 **Implementation:** System timer tracks approval delays and automatically forwards requests.

4.2.3 BR-008: Balance Update Timing

Rule: Employee vacation balance updates only after General Manager approval. **Applicable Use Cases:** UC-4, UC-12 **Implementation:** System triggers balance recalculation upon GM approval, not at earlier stages.

4.2.4 BR-009: Rejection Documentation

Rule: All rejections must include a mandatory reason. **Applicable Use Cases:** UC-4, UC-5 **Implementation:** System validates that reason field is populated before allowing rejection submission.

4.2.5 BR-010: No Modification Policy

Rule: Submitted vacation requests cannot be modified. **Applicable Use Cases:** UC-1 **Implementation:** System locks all request fields after submission, allowing only cancellation.

4.3 Validation Rules

4.3.1 BR-011: Date Validation

Rule: Start date must be in the future, and end date must be after start date. **Applicable Use Cases:** UC-1 **Implementation:** System validates date inputs in real-time and prevents submission of invalid dates.

4.3.2 BR-012: Overlap Prevention

Rule: The system must ensure an employee has at most one active vacation request for any given date range. **Applicable Use Cases:** UC-1 **Implementation:** System checks existing requests against proposed dates and blocks submission if conflicts exist.

4.3.3 BR-013: Balance Validation

Rule: Requested vacation days must not exceed available leave balance. **Applicable Use Cases:** UC-1 **Implementation:** System calculates available balance (Total - Taken - Pending) and validates against request.

4.3.4 BR-014: Attachment Requirements

Rule: Medical certificates are mandatory for sick leave requests. **Applicable Use Cases:** UC-1, UC-4 **Implementation:** System requires file upload for sick leave type and validates attachment presence.

4.3.5 BR-015: Cancellation Eligibility

Rule: Only requests in Pending or Approved status can be cancelled. **Applicable Use Cases:** UC-2, UC-3, UC-5 **Implementation:** System checks request status and enables/disables cancellation functionality accordingly.

4.3.6 BR-016: Cancellation Timing

Rule: Cancellation must occur before vacation start date. **Applicable Use Cases:** UC-2, UC-5 **Implementation:** System compares current date with vacation start date and blocks late cancellations.

4.4 System Behavior Rules

4.4.1 BR-017: Notification Delivery

Rule: System must notify all stakeholders of status changes within 5 minutes. **Applicable Use Cases:** UC-1, UC-2, UC-4, UC-5, UC-11 **Implementation:** Real-time notification system triggers alerts upon workflow state changes.

4.4.2 BR-018: Data Integrity

Rule: All vacation transactions must maintain complete audit trail. **Applicable Use Cases:** All UC **Implementation:** System logs all actions with timestamp, user ID, and action details.

4.4.3 BR-019: Policy Configuration

Rule: Vacation policies must be configurable through administrative interface. **Applicable Use Cases:** UC-12 **Implementation:** System provides configuration screens for entitlement days, eligibility criteria, and escalation timeframes.

5 User Requirements / Use Cases

This section provides high-level descriptions of the system's use cases. For detailed specifications, including triggers, basic/alternate flows, business validation rules, non-functional constraints, and exceptions, please refer to the All-UseCases.json document.

5.1 Use Case Summary

The system implements 12 core use cases that cover all aspects of vacation management:

ID	Use Case Name	Primary Actor	Business Rules
UC-1	Employee Submits Vacation Request	Employee	BR-001, BR-002, BR-003, BR-011, BR-012, BR-013, BR-014
UC-2	Employee Submits Vacation Cancellation Request	Employee	BR-015, BR-016
UC-3	My Vacation Requests	Employee	BR-015, BR-016
UC-4	Review Vacation Request (Approval/Rejection)	Manager/HR/GM	BR-006, BR-007, BR-008, BR-009, BR-014
UC-5	Review Vacation Cancellation Request	Manager/HR	BR-015, BR-016, BR-009
UC-6	Pending Vacation Requests	Manager/HR	BR-006, BR-007
UC-7	Vacation Inquiry (Search Parameters)	HR/Managers/Employee	BR-018
UC-8	Vacation Inquiry (Search Results)	HR/Managers/Employee	BR-018
UC-9	Print Single Vacation Transaction Report (PDF)	HR/Managers/Employee	BR-018
UC-10	Print Comparative Annual Report (PDF)	HR/Managers/GM	BR-018
UC-11	Notifications Center	All Users	BR-017
UC-12	Automated Update of Employee Annual Vacation Balance	System	BR-001, BR-002, BR-008, BR-019

Table 3: Use Case Summary with Business Rule References

5.2 Use Case Details

The following use cases are implemented in the system:

5.2.1 UC-1: Employee Submits Vacation Request

SUMMARY			
ID	UC-1		
Name	Employee Submits Vacation Request		
Goal	Allow an employee to submit a vacation request and route it to the manager for approval.		
Actors	Employee		
TRIGGERS			
Trigger	Employee initiates a new vacation request in the portal.		
PRE-CONDITIONS			
1	Employee is authenticated in the HR system.		
2	Employee has a non-zero leave balance.		
BASIC FLOW (MAIN SUCCESS SCENARIO)			
#	User Action	System Response	
1	Employee navigates to "Request Vacation".	System displays the vacation request form.	
2	Employee enters start date, end date, and reason.	System auto-populates employee details, validates dates in real-time, and shows current leave balance.	
3	Employee clicks "Submit".	System saves request and assigns a Request ID.	
BUSINESS VALIDATION RULES			
Rule ID	Description	Condition	Message ID
BV-001	End date must be strictly after start date.	endDate > startDate	MSG-101
BV-002	Requested days must not exceed available leave balance.	daysRequested ≤ leaveBalance	MSG-102
BV-003	Sick leave requires a medical certificate attachment.	type == "Sick"	MSG-103
NON-FUNCTIONAL CONSTRAINTS			
Constraint ID	Description	Condition	
NFR-001	Submission should complete quickly for good UX.	submissionTime < 120s	
EXCEPTIONS (ERROR CONDITIONS)			
ID	At Step	Issue	Resolution
EX-1	Step 2	Insufficient leave balance.	System blocks submission and displays an error.
EX-2	Step 3	HR database unavailable.	System shows error and asks to retry later.
ALTERNATE FLOWS (OPTIONAL VARIATIONS)			
ID	At/From Step	Description	Outcome / Resolution
AF-1	Step 2	Employee selects dates overlapping an existing request.	System warns and allows confirm-or-adjust.
AF-2	Step 3	Employee cancels before submission.	System discards input and returns to dashboard.
POST-CONDITIONS			
1	Request stored with status "Pending Approval".		
2	Manager notified; can approve or reject.		
3	Employee can track status from dashboard.		
NOTES			
Note	Medical certificate required for sick leave; quick submission ensures good user experience.		

Figure 6: UC-1: Employee Vacation Request Use Case

5.2.2 UC-2: Employee Submits Vacation Cancellation Request

SUMMARY			
ID	UC-2		
Name	Employee Submits Vacation Cancellation Request		
Goal	Allow an employee to cancel a submitted vacation request before its start date.		
Actors	Employee		
TRIGGERS			
Trigger	Employee decides they no longer need a previously requested vacation.		
PRE-CONDITIONS			
1	Employee has an existing vacation request in pending or approved status.		
2	Vacation request has not yet started.		
3	Employee is a full-time Muslim Saudi employee (system scope).		
4	Employee is not a trainee (system scope).		
5	System is accessible via web or mobile app.		
BASIC FLOW (MAIN SUCCESS SCENARIO)			
#	User Action	System Response	
1	Employee opens the Vacation Cancellation Request screen.	System displays the cancellation request form.	
2	—	System auto-populates employee details (Name, ID) as read-only.	
3	—	System displays original request details (Type, Dates, Period, Notes, Attachments) in read-only mode.	
4	Employee optionally enters a cancellation reason.	System accepts input.	
5	Employee reviews all details.	System waits for confirmation.	
6	Employee clicks Submit Cancellation.	System validates request and submits for approval with status 'Pending'.	
7	Employee clicks Cancel instead.	System discards input and returns to dashboard.	
APPROVAL FLOW (MANAGER / HR / GENERAL MANAGER)			
#	Reviewer Action	System Response	
1	Reviewer opens the Vacation Cancellation Request screen.	System shows original request and cancellation details.	
2	Reviewer optionally enters notes.	System accepts input.	
3	Reviewer clicks Approve or Reject.	System updates status and records decision.	
BUSINESS VALIDATION RULES			
Rule ID	Description	Condition	Message ID
BV-201	Cancellation must occur before vacation start date.	currentDate < vacationStartDate	MSG-201
BV-202	Only requests in Pending or Approved status can be cancelled.	status ∈ {Pending, Approved}	MSG-202
BV-203	Cancellation request data must match original request.	cancellationData == originalData	MSG-203
EXCEPTIONS (ERROR CONDITIONS)			
ID	At Step	Issue	Resolution
EX-1	Step 6	Cancellation attempted after start date.	System blocks submission and shows error message MSG-204.
EX-2	Step 6	Request not in Pending or Approved status.	System prevents cancellation and shows error message MSG-205.
EX-3	Step 6	Data inconsistency detected.	System rejects cancellation and notifies HR.
POST-CONDITIONS			
1	Cancellation request stored with status Pending until reviewed.		
2	If approved: HR and Manager notified, vacation officially cancelled.		
3	If rejected: Employee notified, original vacation request remains active.		
NOTES			
Note	Maintain link between original vacation requests and their cancellations for data integrity.		

Figure 7: UC-2: Employee Vacation Cancellation Request Use Case

5.2.3 UC-3: My Vacation Requests

SUMMARY			
ID	UC-3		
Name	My Vacation Requests		
Goal	Provide employees with a centralized screen to view, track, and manage their vacation requests.		
Actors	Employee		
TRIGGERS			
Trigger	Employee navigates to the 'My Vacation Requests' screen.		
PRE-CONDITIONS			
1	Employee has access to the vacation management system (web or mobile).		
2	Employee is a full-time Muslim Saudi employee (system scope).		
3	Employee is not a trainee (system scope).		
BASIC FLOW (MAIN SUCCESS SCENARIO)			
#	User Action	System Response	
1	Employee selects 'My Vacation Requests' from the dashboard.	System displays a summary table of vacation requests.	
2	Employee views columns: Vacation Type, Start Date, End Date, Status, and Expand/Collapse control.	System shows summarized requests in tabular format.	
3	Employee clicks the expand icon for a specific request.	System expands and displays detailed request information.	
4	—	System displays Vacation Request Details (Vacation Type, Dates, Period, Notes) as read-only.	
5	—	System displays Review History table with Reviewer, Notes, Status, and Date.	
6	—	System displays Attachments table with file numbers and file names.	
7	Employee views the Actions section with the Cancel button.	System enables or disables the Cancel button depending on rules.	
BUSINESS VALIDATION RULES			
Rule ID	Description	Condition	Message ID
BV-301	Cancel button disabled for approved requests.	status == Approved	MSG-301
BV-302	Cancel button disabled for already cancelled requests.	status == Cancelled	MSG-302
BV-303	Cancel button disabled for requests with passed start dates.	currentDate >= startDate	MSG-303
BV-304	All request details displayed in detailed view are read-only.	fieldEditable == false	MSG-304
EXCEPTIONS (ERROR CONDITIONS)			
ID	At Step	Issue	Resolution
EX-1	Step 3	Employee attempts to expand request but data is unavailable.	System shows error message MSG-304.
EX-2	Step 7	Employee clicks Cancel on a disabled button.	System ignores action and provides tooltip explaining why.
EX-3	Step 7	System fails to load attachments.	System shows warning 'Attachments unavailable' but continues displaying other details.
POST-CONDITIONS			
1	Employee has visibility into all their vacation requests in summary and detailed view.		
2	Employee can only cancel requests when rules allow.		
3	System maintains audit trail of all actions and reviews.		
NOTES			
Note	Interactive features include expandable/collapsible details and conditional cancel button enablement.		
Note	Maintain strict data integrity by keeping all detailed fields read-only.		

Figure 8: UC-3: My Vacation Requests Use Case

5.2.4 UC-4: Review Vacation Request (Approval/Rejection)

SUMMARY			
ID	UC-4		
Name	Review Vacation Request (Approval / Rejection)		
Goal	Enable managers, HR, and the General Manager to review, approve, or reject employee vacation requests.		
Actors	Direct Manager, HR, General Manager		
TRIGGERS			
Trigger	A vacation request is submitted by an employee and routed for review.		
PRE-CONDITIONS			
1	Employee has submitted a valid vacation request.		
2	System has routed the request to the current reviewer (Manager, HR, or General Manager).		
3	Reviewer has access to the vacation management system (web or mobile).		
BASIC FLOW (MAIN SUCCESS SCENARIO)			
#	Reviewer Action	System Response	
1	Reviewer opens the vacation request from their dashboard or notification link.	System displays request details in read-only mode.	
2	—	System shows Employee Name, Employee ID, Department, Vacation Type, Start Date, End Date, Period, Notes, and Attachments (if any).	
3	Reviewer enters a mandatory reason in the 'Reason for Accept/Reject' textarea.	System validates that input is provided.	
4	Reviewer clicks 'Approve'.	System records approval, updates status, and routes to the next level (HR or General Manager).	
5	Reviewer clicks 'Reject'.	System records rejection, updates status to 'Rejected', and notifies the employee immediately.	
6	General Manager approves final request.	System finalizes approval and updates the employee's vacation balance.	
BUSINESS VALIDATION RULES			
Rule ID	Description	Condition	Message ID
BV-401	Reason for decision is mandatory for all reviewers.	reason != null && reason.trim() != "	MSG-401
BV-402	Attachments are mandatory for sick leave requests.	vacationType == 'Sick' → attachments.length > 0	MSG-402
BV-403	Vacation balance is updated only after General Manager approval.	approver == GeneralManager && decision == 'Approve'	MSG-403
BV-404	System auto-escalates pending requests after 2 days.	approvalPending > 2 days	MSG-404
EXCEPTIONS (ERROR CONDITIONS)			
ID	At Step	Issue	Resolution
EX-1	Step 3	Reviewer tries to approve/reject without entering a reason.	System blocks action and displays error message MSG-401.
EX-2	Step 2	Sick leave request submitted without attachments.	System blocks progression and prompts employee to upload mandatory attachments.
EX-3	Step 4	Approval delayed more than 2 days.	System auto-escalates to the next reviewer and sends notification.
POST-CONDITIONS			
1	Request status updated (Approved, Rejected, or Escalated).		
2	Employee notified of decision outcome.		
3	Vacation balance updated upon final approval by the General Manager.		
4	System logs reviewer decision, reason, and timestamp for audit purposes.		
NOTES			
Note	System supports review and decision on both web and mobile platforms.		
Note	Notifications contain only the header with a link to the system for full details.		
Note	All request details are displayed in read-only mode to reviewers.		
Note	Maintain audit trail of all review actions including reasons and timestamps.		

Figure 9: UC-4: Review Vacation Request Use Case

5.2.5 UC-5: Review Vacation Cancellation Request

SUMMARY			
ID	UC-5		
Name	Review Vacation Cancellation Request		
Goal	Enable HR and Managers to review and take action (approve or reject) on submitted vacation cancellation requests.		
Actors	Manager, HR		
TRIGGERS			
Trigger	An employee submits a vacation cancellation request, which is routed to HR/Manager for review.		
PRE-CONDITIONS			
1	A valid vacation cancellation request has been submitted by an employee.		
2	The original vacation request must be in Pending or Approved status.		
3	Vacation must not have started (current date < start date).		
4	Reviewer (HR/Manager) has access to the system on web or mobile.		
BASIC FLOW (MAIN SUCCESS SCENARIO)			
#	Reviewer Action	System Response	
1	Reviewer opens the vacation cancellation request from dashboard or notification.	System displays both original vacation request details and cancellation request details in read-only mode.	
2	—	System shows Employee Name, Employee ID, Department, Vacation Type, Start Date, End Date, Period, Notes, Attachments.	
3	—	System shows Cancellation Request ID, Original Request ID, Cancellation Submitted Date/Time, and Cancellation Reason.	
4	Reviewer enters a mandatory reason in 'Reason for Accept/Reject' textarea.	System validates that input is provided.	
5	Reviewer clicks 'Approve Cancellation'.	System records approval, updates status, notifies HR and Manager, and links cancellation with the original request.	
6	Reviewer clicks 'Reject Cancellation'.	System records rejection, updates status to 'Rejected', and notifies the employee immediately.	
BUSINESS VALIDATION RULES			
Rule ID	Description	Condition	Message ID
BV-501	Cancellation must occur before vacation start date.	currentDate < vacationStartDate	MSG-501
BV-502	Only Pending or Approved requests are eligible for cancellation.	status ∈ {Pending, Approved}	MSG-502
BV-503	Reviewer must provide a decision reason.	reason != null && reason.trim() != "	MSG-503
EXCEPTIONS (ERROR CONDITIONS)			
ID	At Step	Issue	Resolution
EX-1	Step 1	Reviewer attempts to review cancellation for a vacation already started.	System blocks review and shows error MSG-501.
EX-2	Step 1	Original request status is not Pending or Approved.	System blocks cancellation review and shows error MSG-502.
EX-3	Step 4	Reviewer attempts to approve/reject without providing a reason.	System prevents action and displays error MSG-503.
POST-CONDITIONS			
1	Cancellation request status is updated to Approved or Rejected.		
2	If Approved: Vacation request is officially cancelled, HR and Manager are notified.		
3	If Rejected: Employee notified, original vacation request remains active.		
4	System maintains audit trail linking original and cancellation requests.		
NOTES			
Note	All original and cancellation request details are read-only for reviewers.		
Note	Cancellation review is accessible from both web and mobile platforms.		
Note	System maintains data integrity by linking original requests with their cancellations.		

Figure 10: UC-5: Review Vacation Cancellation Request Use Case

5.2.6 UC-6: Pending Vacation Requests

SUMMARY			
ID	UC-6		
Name	Pending Vacation Requests		
Goal	To view and manage all vacation requests currently awaiting review and approval.		
Actors	Manager, HR		
TRIGGERS			
Trigger	A manager or HR user selects the 'Pending Vacation Requests' option from the system menu/dashboard.		
PRE-CONDITIONS			
1	There are vacation requests in Pending status.		
2	Reviewer has valid access rights (Manager or HR).		
3	System is available and responsive.		
BASIC FLOW (MAIN SUCCESS SCENARIO)			
#	Actor Action	System Response	
1	Reviewer opens the Pending Vacation Requests screen.	System displays the header 'Pending Vacation Requests (Tasks)' and a grid layout of all pending requests requiring action.	
2	—	System shows grid columns: Employee ID, Name, Department, Vacation Type, Start Date, End Date, Action.	
3	Reviewer locates a specific request in the list.	System highlights the request row and shows a [View Request] button for action.	
4	Reviewer clicks [View Request].	System opens the 'Review Leave Request Screen' with full request details.	
5	On the Review screen, reviewer decides: Accept or Reject.	System validates input, records decision, updates status, and notifies the employee and stakeholders.	
BUSINESS VALIDATION RULES			
Rule ID	Description	Condition	Message ID
BV-601	Only pending requests appear on this screen.	status == 'Pending'	MSG-601
BV-602	Action column always provides [View Request] button.	row ∈ PendingRequests	MSG-602
EXCEPTIONS (ERROR CONDITIONS)			
ID	At Step	Issue	Resolution
EX-1	Step 1	No pending requests exist.	System displays message MSG-601 and disables grid.
EX-2	Step 4	Request no longer pending when opened.	System blocks action and shows error MSG-601.
POST-CONDITIONS			
1	Reviewer can navigate to detailed review for any pending request.		
2	Decisions made in Review screen trigger notifications and workflow updates.		
3	Vacation balance updates after GM final approval.		
NOTES			
Note	This screen is for query and navigation only; decisions are made in the Review screen.		
Note	Auto-escalation applies: requests not acted upon within 2 days escalate to the next level.		
Note	Vacation Reporting Dashboard aggregates pending requests per department for analysis.		

Figure 11: UC-6: Pending Vacation Requests Use Case

5.2.7 UC-7: Vacation Inquiry (Search Parameters)

SUMMARY			
ID	UC-7		
Name	Vacation Inquiry (Search Parameters)		
Goal	To allow users to input search criteria for vacation inquiries.		
Actors	HR, Managers, Authorized Employees		
TRIGGERS			
Trigger	A user navigates to 'Employee Vacation Inquiry - Search Parameters' screen.		
PRE-CONDITIONS			
1	User has valid system access.		
2	Department Master, Employee Master, and Vacation Type data are available.		
3	System is available and responsive.		
BASIC FLOW (MAIN SUCCESS SCENARIO)			
#	Actor Action	System Response	
1	User opens the 'Employee Vacation Inquiry - Search Parameters' screen.	System displays screen header and all search filters in default (empty) state.	
2	User optionally selects From Date and To Date.	System accepts input and validates proper date formatting.	
3	User optionally selects one or more Departments from dropdown.	System loads Department options from Department Master and accepts multi-selection.	
4	User optionally enters Employee Name or ID in text field.	System cross-references Employee Master data for validation.	
5	User optionally selects one or more Vacation Types.	System loads options (Annual, Sick, All) from Vacation Type master data.	
6	User optionally selects one or more Vacation Statuses.	System loads options (Pending, Approved, Rejected, Cancelled, All) from system status list.	
7	User clicks [Generate Report].	System validates entered filters and navigates to the 'Search Results' screen showing matching vacation requests.	
8	User clicks [Reset].	System clears all filters and reloads the screen in default state.	
BUSINESS VALIDATION RULES			
Rule ID	Description	Condition	Message ID
BV-701	From Date and To Date must be valid dates.	Invalid date format or impossible date entered	MSG-701
BV-702	From Date must not be after To Date.	fromDate > toDate	MSG-702
BV-703	Department dropdown options must come from Department Master.	Invalid department selected	MSG-703
EXCEPTIONS (ERROR CONDITIONS)			
ID	At Step	Issue	Resolution
EX-1	Step 2	Invalid date format entered.	System rejects input and shows error MSG-701.
EX-2	Step 2	From Date is after To Date.	System blocks report generation and shows error MSG-702.
EX-3	Step 3	Department not found in master data.	System shows error MSG-703 and prevents submission.
POST-CONDITIONS			
1	System either displays vacation search results based on valid filters or shows appropriate validation errors.		
2	User may reset and re-enter search filters.		
NOTES			
Note	All search parameters are optional — user can generate a report with no filters applied.		
Note	The 'Search Results' screen is a separate use case (UC-8).		
Note	Consistent styling with other inquiry/approval screens must be maintained.		

Figure 12: UC-7: Vacation Inquiry Search Parameters Use Case

5.2.8 UC-8: Vacation Inquiry (Search Results)

SUMMARY			
ID	UC-8		
Name	Vacation Inquiry (Search Results)		
Goal	To display inquiry results in a grid format and allow printing/export actions.		
Actors	HR, Managers, Authorized Employees		
TRIGGERS			
Trigger	User executes a search from the 'Employee Vacation Inquiry - Search Parameters' screen (UC-7).		
PRE-CONDITIONS			
1	User has valid system access.		
2	Valid search criteria executed from UC-7.		
3	System has matching vacation request data.		
BASIC FLOW (MAIN SUCCESS SCENARIO)			
#	Actor Action	System Response	
1	User completes a search in UC-7.	System displays the 'Vacation Inquiry - Search Results' grid with matching requests.	
2	User reviews grid with columns (Employee ID, Employee Name, Vacation Type, Start Date, End Date, Duration, Status, Actions).	System ensures all values are loaded from Employee Master, Department Master, Vacation Type master, and request data.	
3	User clicks [Print] button on an approved request row.	System generates a PDF of the 'Single Transaction Report' including Request Date, Employee details, Vacation details, Reviewer details, Approval Date/Time, and footer (Print Time, Page Number, Printed By).	
4	User clicks [Export to Excel] button.	System exports the current search result set to Excel file format.	
5	User navigates through pagination controls ([Previous], page numbers, [Next], Records per page).	System loads appropriate page of results.	
6	User clicks [New Search] button.	System returns user to UC-7 (Search Parameters) screen.	
BUSINESS VALIDATION RULES			
Rule ID	Description	Condition	Message ID
BV-801	Print option allowed only for Approved requests.	Status != Approved	MSG-801
BV-802	Pagination controls must be consistent and not exceed total record count.	Invalid page number or out of range	MSG-802
EXCEPTIONS (ERROR CONDITIONS)			
ID	At Step	Issue	Resolution
EX-1	Step 3	User clicks [Print] on a non-approved request.	System blocks action and shows MSG-801.
EX-2	Step 5	User attempts to navigate to an invalid page.	System displays MSG-802 and retains current page view.
POST-CONDITIONS			
1	System displays inquiry results in a structured grid.		
2	User may print single transaction reports for approved requests.		
3	User may export results to Excel.		
4	User may navigate pages or initiate a new search.		
NOTES			
Note	The grid layout follows consistent styling with UC-6 Pending Requests screen.		
Note	The Single Transaction Report layout (Screen 7) includes all mandatory footer elements.		
Note	Export to Excel is intended for bulk reporting, while Print is for individual approved transactions.		

Figure 13: UC-8: Vacation Inquiry Search Results Use Case

5.2.9 UC-9: Print Single Vacation Transaction Report (PDF)

SUMMARY			
ID	UC-9		
Name	Print Single Vacation Transaction Report (PDF)		
Goal	To generate a PDF with complete details of an approved vacation request.		
Actors	HR, Managers, Authorized Employees		
TRIGGERS			
Trigger	User clicks the [Print] button from UC-8 (Vacation Inquiry – Search Results) on an Approved request.		
PRE-CONDITIONS			
1	User has valid system access.		
2	Vacation request status must be Approved.		
3	All request data and approval logs are available in the system.		
BASIC FLOW (MAIN SUCCESS SCENARIO)			
#	Actor Action	System Response	
1	User clicks the [Print] button in UC-8 for an approved request.	System validates request status (must be Approved).	
2	User waits while PDF is generated.	System fetches request, employee, vacation, and approval details.	
3	System generates PDF including Request Information, Employee Information, Vacation Details, Approval Information, and Standard Footer.	System ensures all mandatory fields are populated.	
4	PDF is displayed or downloaded.	System ensures correct footer elements (Print Time, Page Number, Printed By) are included on each page.	
BUSINESS VALIDATION RULES			
Rule ID	Description	Condition	Message ID
BV-901	Report can only be generated for Approved vacation requests.	If status != Approved	MSG-801
BV-902	All footer elements must be included in every page of the PDF.	Missing footer info	MSG-902
EXCEPTIONS (ERROR CONDITIONS)			
ID	At Step	Issue	Resolution
EX-1	Step 1	User clicks Print on non-approved request.	System blocks action and shows MSG-801.
EX-2	Step 3	PDF generation error due to missing mandatory data.	System shows MSG-902.
POST-CONDITIONS			
1	System generates a single vacation transaction PDF.		
2	PDF includes Request Info, Employee Info, Vacation Details, Approval Info, and Footer.		
3	PDF is available for download or direct print.		
NOTES			
Note	The PDF layout corresponds to 'Print Layout - Single Transaction Report' as referenced in UC-8.		
Note	Attachments are included as file links when available; mandatory for Sick leave requests.		
Note	Approval section must display all approvers with job titles and approval timestamps.		

Figure 14: UC-9: Print Single Vacation Transaction Report Use Case

5.2.10 UC-10: Print Comparative Annual Report (PDF)

SUMMARY			
ID	UC-10		
Name	Print Comparative Annual Report (PDF)		
Goal	To generate an annual comparative vacation report by department, optionally including employee details.		
Actors	HR, Managers, General Management		
TRIGGERS			
Trigger	User defines filters (Department, Start Date, End Date, Details flag) and clicks [Print Comparative Report] button.		
PRE-CONDITIONS			
1	User has valid access rights to reporting functionality.		
2	Department and employee vacation data must exist in the system.		
BASIC FLOW (MAIN SUCCESS SCENARIO)			
#	Actor Action	System Response	
1	User opens the Comparative Annual Report screen (print layout).	System displays report filters: Department(s), Date Range, Details flag.	
2	User selects Department(s) and optional filters (Start Date, End Date, Details flag).	System accepts entered filter inputs (no validation required for Start vs End date).	
3	User clicks [Print Comparative Report].	System retrieves aggregated data grouped by Department.	
4	System generates a PDF including Department Name, Total Annual Vacation Days, Remaining Balance.	If Details flag = true, employee names are listed under each Department.	
5	System appends standard footer info on each page (Print Time, Page Number, Printed By).	System outputs PDF for user to download/print.	
BUSINESS VALIDATION RULES			
Rule ID	Description	Condition	Message ID
BV-1002	At least one Department must be selected or 'All Departments' chosen.	If Department field is empty	MSG-1002
BV-1003	Footer elements must appear on every page of the PDF.	If footer missing	MSG-902
EXCEPTIONS (ERROR CONDITIONS)			
ID	At Step	Issue	Resolution
EX-1	Step 2	No Department selected.	System blocks action and shows MSG-1002.
EX-2	Step 4	Report generation fails due to missing/invalid data.	System shows MSG-902.
POST-CONDITIONS			
1	System generates the Comparative Annual Report PDF.		
2	Report contains department totals and balances, with optional employee details.		
3	Standard footer is included on all pages.		
NOTES			
Note	The report period is derived from the entered Start Date and End Date: typically the calendar year.		
Note	If Start Date is after End Date, the system does not raise a validation error; it simply returns an empty result set.		
Note	Employee details appear only when the 'Details flag' is checked by the user.		
Note	The data dictionary for this report defines fields Department, Total Days, Balance, Employee Name (optional), Period, and Footer Info.		

Figure 15: UC-10: Print Comparative Annual Report Use Case

5.2.11 UC-11: Notifications Center

SUMMARY			
ID	UC-11		
Name	Notifications Center		
Goal	To inform users of vacation-related events and provide quick access to related details or actions.		
Actors	Employees, Managers, HR, General Management		
TRIGGERS			
Trigger	Vacation-related events occur in the system (e.g., request submission, approval, rejection, pending review, comments, attachment requirements).		
PRE-CONDITIONS			
1	User has valid system access.		
2	Relevant vacation transactions or actions exist in the system.		
BASIC FLOW (MAIN SUCCESS SCENARIO)			
#	Actor Action	System Response	
1	User navigates to the Notifications Center screen.	System displays a chronological list of notifications, newest first.	
2	User reviews Notification Text (Action Type, Vacation Details, Employee Name, Context).	System shows card-style notifications with clear hierarchy.	
3	User clicks [View] button on a notification.	System opens the detailed view of the related vacation request.	
4	User clicks the [Context Button] on a notification.	System navigates the user to the relevant section (e.g., 'My Requests' or 'Pending Tasks').	
5	User takes no action.	System continues to display notifications until they are marked as read or expire based on rules.	
NOTIFICATION TYPES			
Type	Example Text		
Approval	Annual Leave (20–25 Aug, 6 days) for Omar Abdelrahman was approved.		
Rejection	Sick Leave (12–14 Sep, 3 days) for Omar Abdelrahman was rejected. Reason: No medical note.		
Pending Approval	Annual Leave (18–20 Sep, 3 days) for Omar Abdelrahman is pending manager approval.		
Review Notes	Reviewer Ahmed Mostafa left a note on Casual Leave (02–03 Oct): 'Please adjust dates.'		
Attachment Review	Sick Leave (05–06 Oct, 2 days) for Omar Abdelrahman needs attachment review.		
General Updates	General notification to stakeholders when requests are submitted, approved, rejected, or cancelled.		
BUSINESS RULES			
Rule ID	Description		
BR-1101	System displays notifications relevant to the logged-in user's role (Employee, Manager, HR, etc.).		
BR-1102	Notifications appear in reverse chronological order, newest first.		
BR-1103	Employees must receive notifications upon request acceptance or rejection.		
BR-1104	Approved vacation cancellations trigger notifications for both HR and the Manager.		
BR-1105	When HR and Managers are notified, only the header with a link is shown; full request details are visible after clicking the link.		
BR-1106	Each notification must contain text and at least one actionable button ([View] or Context).		
EXCEPTIONS (ERROR CONDITIONS)			
ID	At Step	Issue	Resolution
EX-1	Step 1	No notifications available.	System displays an empty state message: MSG-1101.
EX-2	Step 3	User clicks [View] but underlying request has been deleted or is inaccessible.	System shows message: MSG-1102.
POST-CONDITIONS			
1	User is informed about vacation-related actions through notifications.		
2	User can access related screens (detailed request or task list) directly from notifications.		
3	Notifications remain available until acknowledged, expired, or cleared by system rules.		
NOTES			
Note	Notification cards follow a clean layout with clear text hierarchy and action buttons.		
Note	System ensures contextual navigation via [View] or [Context] buttons.		

Figure 16: UC-11: Notifications Center Use Case

5.2.12 UC-12: Automated Update of Employee Annual Vacation Balance

SUMMARY			
ID	UC-12		
Name	Automated Update of Employee Annual Vacation Balance		
Goal	To ensure employee vacation balances are automatically calculated, updated, and compliant with policies, without manual overrides.		
Actors	System (primary), Employee (view-only), General Manager (approval trigger)		
TRIGGERS			
Trigger-1	General Manager approves a vacation request.		
Trigger-2	Annual allocation is applied (21 or 30 days entitlement based on policy).		
Trigger-3	Employee eligibility changes (10+ years of service or age ≥ 50).		
PRE-CONDITIONS			
1	Employee is an eligible full-time Muslim Saudi employee (trainees are excluded).		
2	Vacation Types Master Data defines annual entitlement (21 or 30 days).		
3	Employee Master Data includes Hire Date and Birth Date (for entitlement eligibility).		
4	Vacation request has passed the multi-level approval workflow up to General Manager.		
BASIC FLOW (MAIN SUCCESS SCENARIO)			
#	Actor Action	System Response	
1	General Manager approves an employee's vacation request.	System immediately recalculates the employee's vacation balance (Total – Taken – Pending = Balance).	
2	System applies entitlement rules (21 or 30 days depending on service/age).	Balance is updated accordingly in Employee Master Data.	
3	Employee views their vacation balance and history in view-only mode.	System displays updated balance and vacation access history report.	
4	At the start of a new calendar year.	System assigns annual entitlement (21 or 30 days), without carrying forward unused days.	
BUSINESS RULES			
Rule ID	Description		
BR-1201	Leave Balance = Total – Taken – Pending.		
BR-1202	Vacation balance updates immediately after General Manager approval.		
BR-1203	Annual entitlement is 21 days; increased to 30 days if service ≥ 10 years or age ≥ 50.		
BR-1204	Unused days are forfeited at year-end (no carryover or compensation).		
BR-1205	Vacation Types supported: Annual and Sick only.		
BR-1206	No overlapping requests are allowed for the same employee.		
BR-1207	Trainees are not eligible to submit vacation requests.		
BR-1208	Manual overrides of balance are not allowed (system-only updates).		
BR-1209	Vacation policies must be configurable for maintainability.		
BR-1210	System complies with Saudi vacation regulations only (Muslim Saudi, full-time employees).		
EXCEPTIONS (ERROR CONDITIONS)			
ID	At Step	Issue	Resolution
EX-1	Step 1	Balance calculation fails due to missing Employee Master Data fields.	System logs error and displays message: MSG-1201.
EX-2	Step 2	Employee is ineligible (trainee or outside Saudi regulation scope).	System blocks request and shows message: MSG-1202.
EX-3	Step 3	User attempts to manually override balance.	System prevents override and enforces automation rule.
POST-CONDITIONS			
1	Vacation balances are always up-to-date and auto-calculated.		
2	Employees can view, but not edit, their vacation balances and history.		
3	System enforces organizational vacation policies automatically.		
NOTES			
Note	System recalculates vacation balances immediately after GM approval.		

Figure 17: UC-12: Automated Update of Employee Annual Vacation Balance Use Case

5.3 System Component Mapping and Traceability

The following table provides a comprehensive mapping between use cases, business rules, functional requirements, user interfaces, and data entities to ensure complete traceability:

Use Case	Business Rules	Functional Requirements	User Interfaces	Data Entities
UC-1	BR-001, BR-002, BR-003, BR-011, BR-012, BR-013, BR-014	FR-001	Vacation Request Screen	Employee Master, Vacation Request, Vacation Types
UC-2	BR-015, BR-016	FR-002	Vacation Cancellation Screen	Vacation Cancellation, Vacation Request
UC-3	BR-015, BR-016	FR-002	My Vacation Requests Screen	Vacation Request, Vacation Cancellation
UC-4	BR-006, BR-007, BR-008, BR-009, BR-014	FR-003	Review Vacation Request Screen	Vacation Request, Approval History
UC-5	BR-015, BR-016, BR-009	FR-003	Review Cancellation Screen	Vacation Cancellation, Approval History
UC-6	BR-006, BR-007	FR-003	Pending Requests Screen	Vacation Request, Approval History
UC-7	BR-018	FR-004	Inquiry Search Parameters	Employee Master, Departments, Vacation Types
UC-8	BR-018	FR-004	Inquiry Search Results	Vacation Request, Employee Master
UC-9	BR-018	FR-005	Single Transaction Report	Vacation Request, Employee Master, Approval History
UC-10	BR-018	FR-005	Comparative Report	Employee Master, Departments, Vacation Request
UC-11	BR-017	FR-007	Notifications Center	Notification Data
UC-12	BR-001, BR-002, BR-008, BR-019	FR-006	System Process	Employee Master, Vacation Request

Table 4: Correspondence between System Components and Testability Metrics

This mapping ensures that:

- Each use case is supported by appropriate business rules
- Functional requirements are derived from use cases
- User interfaces are designed for specific use cases
- Data entities support all system operations
- Complete traceability is maintained throughout the system

6 Functional Requirements

This section lists what the system must do. Each functional requirement references applicable business rules (Section 4) and is traced to use cases (Section 5), where detailed flows illustrate scenarios. Avoid duplicating scenario steps here; use cases serve as the canonical behavioral narratives.

6.1 FR-001: Vacation Request Management

Description: The system must allow employees to create and submit vacation requests. **Inputs:** Start date, end date, vacation type, notes, attachments **Processing:** Validate dates, check balance, calculate period, prevent overlaps **Outputs:** Request ID, confirmation message, workflow initiation **Business Rules:** BR-001, BR-002, BR-003, BR-011, BR-012, BR-013, BR-014 **Use Cases:** UC-1

6.2 FR-002: Vacation Cancellation Management

Description: The system must allow employees to cancel pending or approved vacation requests. **Inputs:** Cancellation reason, original request reference **Processing:** Validate cancellation eligibility, create cancellation request **Outputs:** Cancellation request ID, approval workflow initiation **Business Rules:** BR-015, BR-016 **Use Cases:** UC-2, UC-3

6.3 FR-003: Multi-Level Approval Workflow

Description: The system must implement a four-level approval process with automatic escalation. **Inputs:** Manager decisions, reasons, approval levels **Processing:** Route through approval hierarchy, track decisions, escalate delays **Outputs:** Approval status updates, notifications, workflow progression **Business Rules:** BR-006, BR-007, BR-008, BR-009 **Use Cases:** UC-4, UC-6

6.4 FR-004: Vacation Inquiry and Search

Description: The system must provide comprehensive search and inquiry capabilities. **Inputs:** Search criteria (dates, department, employee, type, status) **Processing:** Apply filters, execute search, paginate results **Outputs:** Filtered results grid, export options, pagination controls **Business Rules:** BR-018 **Use Cases:** UC-7, UC-8

6.5 FR-005: Report Generation

Description: The system must generate PDF reports for vacation data. **Inputs:** Report parameters, data selection, format preferences **Processing:** Format data, generate PDF, include standard footer **Outputs:** PDF report with complete details and footer information **Business Rules:** BR-018 **Use Cases:** UC-9, UC-10

6.6 FR-006: Automated Balance Management

Description: The system must automatically calculate and update employee vacation balances. **Inputs:** Approval triggers, entitlement rules, usage data **Processing:** Calculate balance, apply entitlement rules, update records **Outputs:** Updated vacation balances, audit trail **Business Rules:** BR-001, BR-002, BR-008, BR-019 **Use Cases:** UC-12

6.7 FR-007: Notification System

Description: The system must provide real-time notifications for all stakeholders. **Inputs:** System events, user preferences, notification types **Processing:** Generate notifications, deliver to users, track delivery **Outputs:** User notifications, delivery confirmations **Business Rules:** BR-017 **Use Cases:** UC-11

7 Non-Functional Requirements

7.1 Performance Requirements

7.1.1 NFR-001: Response Time

Requirement: Page load must complete within 3 seconds from user click to interactive display. **Measurement:** Time from HTTP request initiation to page render completion. **Applicable Use Cases:** All user interface interactions.

7.1.2 NFR-002: Throughput

Requirement: System must support 100+ concurrent users without performance degradation. **Measurement:** Response time remains under 3 seconds with 100 simultaneous users. **Applicable Use Cases:** All system functions.

7.1.3 NFR-003: Availability

Requirement: System must maintain 99.5% uptime during business hours (8 AM - 6 PM, Sunday-Thursday). **Measurement:** Monthly uptime calculation excluding scheduled maintenance. **Applicable Use Cases:** All system functions.

7.1.4 NFR-004: Scalability

Requirement: System must support up to 1000 employees without architectural changes. **Measurement:** Performance metrics remain within acceptable ranges at maximum capacity. **Applicable Use Cases:** All system functions.

7.1.5 NFR-005: PDF Generation

Requirement: PDF report generation must complete within 5 seconds for standard reports. **Measurement:** Time from report request to PDF download availability. **Applicable Use Cases:** UC-9, UC-10.

7.2 Security Requirements

7.2.1 NFR-006: Authentication

Requirement: System must implement secure login with session management. **Implementation:** Multi-factor authentication, session timeout after 30 minutes of inactivity. **Applicable Use Cases:** All system access.

7.2.2 NFR-007: Authorization

Requirement: System must implement role-based access control. **Implementation:** User permissions based on organizational role and hierarchy. **Applicable Use Cases:** All system functions.

7.2.3 NFR-008: Data Protection

Requirement: System must encrypt sensitive employee information. **Implementation:** AES-256 encryption for data at rest and in transit. **Applicable Use Cases:** All data handling functions.

7.2.4 NFR-009: Audit Trail

Requirement: System must log all activities for audit purposes. **Implementation:** Comprehensive logging of user actions, system events, and data changes. **Applicable Use Cases:** All system functions.

7.2.5 NFR-010: Input Validation

Requirement: System must prevent SQL injection and XSS attacks. **Implementation:** Input sanitization, parameterized queries, output encoding. **Applicable Use Cases:** All user input functions.

7.3 Usability Requirements

7.3.1 NFR-011: User Interface

Requirement: System must provide intuitive, responsive design. **Implementation:** Modern web standards, consistent navigation, clear visual hierarchy. **Measurement:** SUS score ≥ 80 from usability tests. **Applicable Use Cases:** All user interface interactions.

7.3.2 NFR-012: Accessibility

Requirement: System must comply with WCAG 2.1 AA standards. **Implementation:** Screen reader support, keyboard navigation, color contrast compliance. **Applicable Use**

Cases: All user interface interactions.

7.3.3 NFR-013: Multi-language Support

Requirement: System must support Arabic and English languages. **Implementation:** Localized interface, right-to-left text support, cultural adaptations. **Applicable Use Cases:** All user interface interactions.

7.3.4 NFR-014: Mobile Support

Requirement: System must provide responsive design for all devices. **Implementation:** Mobile-first design, touch-friendly interfaces, adaptive layouts. **Measurement:** Lighthouse mobile performance score ≥ 80 . **Applicable Use Cases:** All user interface interactions.

7.3.5 NFR-015: Error Handling

Requirement: System must provide clear, actionable error messages. **Implementation:** User-friendly error descriptions with specific resolution steps. **Applicable Use Cases:** All system functions.

7.4 Reliability Requirements

7.4.1 NFR-016: Error Handling

Requirement: System must handle errors gracefully without data loss. **Implementation:** Comprehensive error catching, user notification, automatic recovery where possible. **Applicable Use Cases:** All system functions.

7.4.2 NFR-017: Data Integrity

Requirement: System must prevent data corruption and maintain consistency. **Implementation:** Transaction management, referential integrity, validation checks. **Applicable Use Cases:** All data operations.

7.4.3 NFR-018: Backup and Recovery

Requirement: System must provide daily automated backups with 4-hour maximum recovery time. **Implementation:** Automated backup scheduling, point-in-time recovery capability. **Applicable Use Cases:** All system functions.

7.4.4 NFR-019: Validation

Requirement: System must implement comprehensive business rule validation. **Implementation:** Real-time validation, business rule enforcement, error prevention. **Applicable Use Cases:** All data input functions.

8 User Interface Overview

This section provides a high-level overview of the user interface structure and references the comprehensive wireframes. Detailed visual specifications are centralized in Appendix C: Wireframe Images.

8.1 Core Application Screens

The application includes the following primary screens: Vacation Request, Vacation Cancellation Request, Review Vacation Request, Review Vacation Cancellation, My Vacation Requests, Pending Requests, Notifications Center, and Inquiry (Search Parameters and Results). For full layouts and annotations, see Appendix C.

8.2 Report Layout Screens

Single Transaction Report and Annual Comparative Report layouts are provided in Appendix C with full details.

8.3 Additional Screens

Requests Center and Annual Comparative Report Search Parameters are provided in Appendix C.

9 Data Requirements Overview

This section provides a high-level overview of the system's data entities and references a centralized appendix for complete data dictionaries and field definitions.

9.1 Master Data

Employee, Departments, and Vacation Types constitute the core master data used across the system. Complete field definitions, constraints, and validation rules are provided in Appendix B.2.

9.2 Operational Data

Vacation Requests, Vacation Cancellations, Approval History, and Notification Data constitute the operational entities. See Appendix B.2 for full data dictionaries.

10 System Messages

The system includes a comprehensive message table for all user communications and error messages. This table defines the content, context, and display rules for system-generated messages.

10.1 System Messages Table

The following images show the complete system messages table:

Messages							
Centralized catalog of user/system messages with unique IDs for cross-referencing in use cases							
Message ID	Name	Audience	Category	Trigger/Context	Text	Related Use Case IDs	Notes
MSG-101	End Date Validation	User	Error	Date validation	End date must be strictly after start date.	UC-1	Basic date validation rule
MSG-102	Leave Balance Exceeded	User	Error	Balance validation	Requested days exceed available leave balance.	UC-1	Prevents over-booking
MSG-103	Medical Certificate Required	User	Error	Document validation	Medical certificate attachment is required for Sick leave.	UC-1	Mandatory for sick leave type
MSG-201	Cancellation Date Validation	User	Error	Cancellation timing	Cancellation must occur before vacation start date.	UC-2	Prevents late cancellations
MSG-202	Invalid Status for Cancellation	User	Error	Status validation	Only requests in Pending or Approved status can be cancelled.	UC-2	Status-based restriction
MSG-203	Data Inconsistency	System	Error	Data validation	Cancellation request data must match original request.	UC-2	Data integrity check
MSG-204	Cancellation After Start Date	User	Error	Cancellation timing	Cancellation attempted after start date.	UC-2	Prevents cancellation of active vacations
MSG-205	Invalid Status for Cancellation Action	User	Error	Status validation	Request not in Pending or Approved status.	UC-2	Status-based restriction
MSG-301	Invalid Approval Action	User	Error	Approval workflow	Only pending requests can be approved or rejected.	UC-3	Prevents action on finalized requests
MSG-302	Missing Approver Comment	User	Error	Approval justification	Rejection requires a mandatory comment.	UC-3	Ensures rejection reason is documented
MSG-303	Duplicate Approval Action	System	Error	Workflow validation	This request has already been processed.	UC-3	Prevents double approvals/rejections
MSG-304	Request Details Not Found	User	Error	Data retrieval	Request details not found.	UC-3	Data availability error
MSG-401	HR Access Only	User	Error	Permission validation	Only HR staff can modify approved vacation records.	UC-4	Restricts unauthorized modifications
MSG-402	Mandatory Justification	User	Error	Modification validation	Modification requires a justification comment.	UC-4	Ensures changes are logged with reasons
MSG-403	Invalid Record State	System	Error	Data state validation	Only approved requests can be modified by HR.	UC-4	Prevents changes to pending or cancelled requests
MSG-501	Vacation Already Started	User	Error	Cancellation review	Reviewer attempts to review cancellation for a vacation already started.	UC-5	Prevents review of active vacations
MSG-502	Invalid Request Status for Cancellation Review	User	Error	Status validation	Original request status is not Pending or Approved.	UC-5	Status-based restriction for cancellation review
MSG-503	Accrual Limit Reached	System	Error	Vacation accrual	Employee has reached the maximum allowable vacation balance.	UC-5	Enforces balance caps
MSG-504	Negative Balance Prevention	System	Error	Balance update	Vacation balance cannot become negative.	UC-5	Prevents invalid deductions
MSG-505	Carryover Validation	System	Error	Year-end processing	Carryover days exceed policy limit.	UC-5	Validates carryover rules

Figure 18: System Messages Table - Part 1

Message ID	Name	Audience	Category	Trigger/Context	Text	Related Use Case IDs	Notes
MSG-601	No Pending Requests	User	Info	Empty state	No Pending Requests	UC-6	Empty state message when no pending requests exist
MSG-701	Search Parameters Required	User	Error	Search validation	Search parameters are required.	UC-7	Ensures search criteria are provided
MSG-702	Invalid Date Range	User	Error	Date validation	From Date is after To Date.	UC-7	Date range validation error
MSG-703	Department Not Found	User	Error	Data validation	Department not found in master data.	UC-7	Department data validation error
MSG-801	Print Not Available	User	Error	Print validation	Print option is available only for Approved requests.	UC-8,UC-9	Print access restriction for non-approved requests
MSG-901	Report Generation Failed	User	Error	Report generation	Failed to generate report. Please try again.	UC-9	Report generation error
MSG-1001	Comparative Report Failed	User	Error	Report generation	Failed to generate comparative report. Please try again.	UC-10	Comparative report generation error
MSG-1002	Department Selection Required	User	Error	Report validation	At least one Department must be selected.	UC-10	Department selection validation
MSG-902	Report Generation Failed - Data Missing	User	Error	Report generation	Unable to generate report – required data missing.	UC-10	Data validation error for report generation
MSG-1101	No Notifications	User	Info	Empty state	No new notifications.	UC-11	Empty state message when no notifications exist
MSG-1102	Request Not Available	User	Error	Data access	Request not available.	UC-11	Request accessibility error
MSG-1201	Balance Update Failed	System	Error	Balance calculation	Unable to update balance – employee data incomplete.	UC-12	Employee data validation error
MSG-1202	Employee Not Eligible	System	Error	Eligibility validation	Vacation request not permitted for this employee type.	UC-12	Employee eligibility restriction

Figure 19: System Messages Table - Part 2

10.2 Message Categories

- Validation Messages:** Field validation errors and business rule violations
- Workflow Messages:** Approval status updates and workflow progression
- Notification Messages:** System notifications and user alerts
- Error Messages:** System errors and exception handling

- **Success Messages:** Confirmation of successful operations

11 Appendices

11.1 Appendix A: Glossary

- **Vacation:** Time off from work for personal reasons
- **Leave Balance:** Remaining vacation days available
- **Approval Workflow:** Process for request authorization
- **Escalation:** Automatic forwarding of delayed requests
- **Attachments:** Supporting documents for requests
- **Entitlement:** Annual vacation days allocation
- **Trainee:** Employee in training status, ineligible for vacation
- **Business Rule:** System behavior rule that governs functionality
- **Use Case:** Specific interaction scenario between users and system

11.2 Appendix B: Data Models

- Entity-Relationship Diagrams
- Database Schema Definitions
- API Specification Documents
- Integration Interface Definitions
- Master Data Entity Definitions

11.3 Appendix B.1: Data Dictionary Template

The following image shows the standard data dictionary template used for documenting all system data entities:

Vacation Request Screen - Data Dictionary

Complete field specifications for the Vacation Request interface

Field Name	Data/UI Type	Is Required	Data Source	Business Rules	Default Values
Employee ID	Text Input (Read-only)	Yes	Employee Master	Unique identifier; auto-filled; cannot be changed	Auto-filled
Employee Name	Text Input (Read-only)	Yes	Employee Master	Full legal name; auto-filled	Auto-filled
Vacation Type	Dropdown (Annual, Sick)	Yes	Vacation Types	Must select valid type	None
Start Date	Date Picker	Yes	User Input	Cannot be in past; must be < End Date	Today+1
End Date	Date Picker	Yes	User Input	Must be after Start Date	None
Period (Days)	Text Display (Read-only)	Yes	System Calculation	End Date - Start Date + 1	Auto-calculated
Notes	Textarea	No	User Input	Optional comments	Blank
Attachments	File Upload	Conditional	User Upload	Mandatory for Sick Leave; optional for Annual Leave	None

Figure 20: Data Dictionary Template

11.4 Appendix B.2: Comprehensive Data Dictionaries

This appendix consolidates all master and screen-level data dictionaries.

Employee Master Data - Data Dictionary

Complete field specifications for the Employee Master Data interface

Field Name	Data/UI Type	Is Required	Data Source	Business Rules	Default Values
Employee ID	Text	Yes	HR System	Unique; Primary Key	Auto-assigned
Employee Name	Text	Yes	HR System	Full legal name	None
Department	Dropdown	Yes	Department Master	Must map to valid department	None
Job Title	Text	Yes	HR System	Used in reporting	None
Employee Status	Enum	Yes	HR System	Active, Trainee, Inactive; Trainees not eligible	Active
Hire Date	Date	Yes	HR System	Used to calculate entitlement (21/30 days rule)	None
Annual Vacation Balance	Number	Yes	System Calc	Auto-updated by the system whenever the employee's balance changes	Auto-calc

Figure 21: Employee Master Data Dictionary

Departments Master Data - Data Dictionary

Complete field specifications for the Departments Master Data interface

Field Name	Data/UI Type	Is Required	Data Source	Business Rules	Default Values
Department ID	Text	Yes	Config	Unique ID	Auto-assigned
Department Name	Text	Yes	Config	Used in filters, reports, and groupings	None
Description	Textarea	No	Config	Optional; up to 500 characters	None
Department Manager	Employee Lookup	No	Employee Master Data	Must reference an active employee; used for approvals and escalations	None
Location	Text	No	Config	Used for reporting and filtering	None
Parent Dept	Text (Optional)	No	Config	Supports hierarchy if needed	Null

Figure 22: Departments Master Data Dictionary

Vacation Types Master Data - Data Dictionary

Complete field specifications for the Vacation Types Master Data interface

Field Name	Data/UI Type	Is Required	Data Source	Business Rules	Default Values
Vacation Type	Enum	Yes	Config	Annual, Sick only	None
Active	Boolean Toggle	Yes	Config	If false, type is hidden from selection; retrieval filters to Active=true	True
Entitlement	Number	Yes	Config	21 or 30 days depending on years of service	21 days
Carry Over	Boolean	Yes	Config	Annual: No carry-over; Sick: No carry-over	False
Proof Required	Boolean	Yes	Config	Sick leave requires attachment	True for Sick

Figure 23: Vacation Types Master Data Dictionary

Master Data Dictionaries

Vacation Request Screen - Data Dictionary

Complete field specifications for the Vacation Request interface

Field Name	Data/UI Type	Is Required	Data Source	Business Rules	Default Values
Employee ID	Text Input (Read-only)	Yes	Employee Master	Unique identifier; auto-filled; cannot be changed	Auto-filled
Employee Name	Text Input (Read-only)	Yes	Employee Master	Full legal name; auto-filled	Auto-filled
Vacation Type	Dropdown (Annual, Sick)	Yes	Vacation Types	Only active types are selectable (Active=true)	None
Start Date	Date Picker	Yes	User Input	Cannot be in past; must be < End Date; Date type: Gregorian or Hijri (set to Gregorian)	Today+1
End Date	Date Picker	Yes	User Input	Must be after Start Date; Date type: Gregorian or Hijri (set to Gregorian)	None
Period (Days)	Text Display (Read-only)	Yes	System Calculation	End Date - Start Date + 1	Auto-calculated
Notes	Textarea	No	User Input	Optional comments	Blank
Attachments	File Upload	Conditional	User Upload	Mandatory for Sick Leave; optional for Annual Leave	None

Figure 24: Vacation Request Screen Data Dictionary

Vacation Cancellation Request Screen - Data Dictionary

Complete field specifications for the Vacation Cancellation Request interface

Field Name	Data/UI Type	Is Required	Data Source	Business Rules	Default Values
Request ID	Text Input (Read-only)	Yes	System	References existing approved vacation	Auto-filled
Employee ID	Text Input (Read-only)	Yes	Employee Master	Same employee who submitted the request	Auto-filled
Employee Name	Text Input (Read-only)	Yes	Employee Master	Same employee	Auto-filled
Vacation Type	Dropdown (Read-only)	Yes	Vacation Types	Same as original request	Auto-filled
Start Date	Date Picker (Read-only)	Yes	Original Request	Must not be started yet; must be < End Date; Date type: Gregorian or Hijri (set to Gregorian)	Auto-filled
End Date	Date Picker (Read-only)	Yes	Original Request	Must be after Start Date; Date type: Gregorian or Hijri (set to Gregorian)	Auto-filled
Reason	Textarea	No	User Input	Optional cancellation justification	Blank
Status	Enum (Pending/Approved/Rejected)	Yes	System	Must pass HR/Manager approval before final cancellation	Pending

Figure 25: Vacation Cancellation Request Screen Data Dictionary

Review Vacation Request Screen - Data Dictionary

Complete field specifications for the Review Vacation Request interface

Field Name	Data/UI Type	Is Required	Data Source	Business Rules	Default Values
Request ID	Text Display (Read-only)	Yes	System	Unique request identifier	Auto-generated
Employee ID	Text Display (Read-only)	Yes	Employee Master	Same as original request	Auto-filled
Employee Name	Text Display (Read-only)	Yes	Employee Master	Full employee name	Auto-filled
Department	Text Display (Read-only)	Yes	Department Master	Employee's department	Auto-filled
Vacation Type	Text Display (Read-only)	Yes	Vacation Types	From employee request	Auto-filled
Start Date	Text Display (Read-only)	Yes	Employee Request	From request; Date type: Gregorian or Hijri (set to Gregorian)	Auto-filled
End Date	Text Display (Read-only)	Yes	Employee Request	From request; Date type: Gregorian or Hijri (set to Gregorian)	Auto-filled
Period	Text Display (Read-only)	Yes	System Calculation	Auto-calculated	Auto-filled
Notes	Text Display	No	Employee Request	Optional comments from request	Blank
Attachments	File Link	Conditional	Employee Request	Must be attached if Sick leave	Auto-filled
Reviewer Notes	Textarea	No	Manager Input	Optional manager comments	Blank
Action	Buttons (Approve/Reject)	Yes	Manager Input	Required decision by reviewer	None

Figure 26: Review Vacation Request Screen Data Dictionary

Review Vacation Cancellation Request Screen - Data Dictionary

Complete field specifications for the Review Vacation Cancellation Request interface

Field Name	Data/UI Type	Is Required	Data Source	Business Rules	Default Values
Cancellation Request ID	Text Display	Yes	System	Links to original request	Auto-generated
Original Request ID	Text Display	Yes	System	Reference of canceled vacation	Auto-filled
Employee ID	Text Display (Read-only)	Yes	Employee Master	From employee record	Auto-filled
Employee Name	Text Display (Read-only)	Yes	Employee Master	From employee record	Auto-filled
Vacation Type	Text Display (Read-only)	Yes	Vacation Types	From request	Auto-filled
Start Date	Text Display (Read-only)	Yes	Employee Request	Must not have started; Date type: Gregorian or Hijri (set to Gregorian)	Auto-filled
End Date	Text Display (Read-only)	Yes	Employee Request	Auto-filled; Date type: Gregorian or Hijri (set to Gregorian)	Auto-filled
Reason	Textarea	No	Employee Input	Cancellation justification	Blank
Reviewer Notes	Textarea	No	Manager Input	Optional HR/Manager comments	Blank
Action	Buttons (Approve/Reject)	Yes	Manager Input	HR/Manager must approve before effective cancellation	None

Figure 27: Review Vacation Cancellation Request Screen Data Dictionary

My Vacation Requests Screen - Data Dictionary

Complete field specifications for the My Vacation Requests interface

Field Name	Data/UI Type	Is Required	Data Source	Business Rules	Default Values
Vacation Type	Text Display	Yes	Vacation Request	Shows in collapsed row view	N/A
Start Date	Text Display	Yes	Vacation Request	Shows in collapsed row view	N/A
End Date	Text Display	Yes	Vacation Request	Shows in collapsed row view	N/A
Status	Text Display	Yes	Workflow State	Current request status (Pending, Approved, Rejected, Canceled)	N/A
Expand/Collapse Control	UI Control	Yes	UI	Toggles detailed view visibility	+
Period	Text Display	Yes	System Calculation	Shows in expanded view; End Date - Start Date + 1	<i>Auto-calculated</i>
Notes	Text Display	No	Vacation Request	Shows in expanded view; Original request notes	N/A
Reviewer Name	Text Display	Yes	Workflow History	Name of the reviewing authority	N/A
Review Notes	Text Display	No	Workflow History	Comments from reviewer	N/A
Review Status	Text Display	Yes	Workflow History	Status given by reviewer	N/A
Review Date	Text Display	Yes	Workflow History	Date and time of review	N/A
File Number	Text Display	Yes	Document Store	Sequential number for attachments	<i>Auto-numbered</i>
File Name	Text Display	Yes	Document Store	Original filename of attachment	N/A
Cancel Button	Action Button	Conditional	UI Control	Enabled only if: Not approved; Not cancelled; Start date not passed	Cancel

Figure 28: My Vacation Requests Screen Data Dictionary

Pending Vacation Requests Screen - Data Dictionary

Complete field specifications for the Pending Vacation Requests interface

Field Name	Data/UI Type	Is Required	Data Source	Business Rules	Default Values
Employee ID	Text Display	Yes	Employee Master	Unique identifier; displayed in grid	N/A
Name	Text Display	Yes	Employee Master	Full employee name	N/A
Department	Text Display	Yes	Department Master	Employee's current department	N/A
Vacation Type	Text Display	Yes	Vacation Request	Type of vacation requested	N/A
Start Date	Text Display	Yes	Vacation Request	Vacation start date in system date format	N/A
End Date	Text Display	Yes	Vacation Request	Vacation end date in system date format	N/A
View Request Button	Action Button	Yes	UI Control	Opens the review screen for the selected request; Always enabled	View Request

Figure 29: Pending Vacation Requests Screen Data Dictionary

Vacation Inquiry Search Parameters Screen - Data Dictionary

Complete field specifications for the Vacation Inquiry Search Parameters interface

Field Name	Data/UI Type	Is Required	Data Source	Business Rules	Default Values
Employee ID	Text Input	No	Employee Master	Optional search filter	Blank
Vacation Type	Dropdown (Annual, Sick)	No	Vacation Types	Optional filter	All
Start Date	Date Picker	No	User Input	Optional range; Date type: Gregorian or Hijri (set to Gregorian)	Blank
End Date	Date Picker	No	User Input	Optional range; Date type: Gregorian or Hijri (set to Gregorian)	Blank
Status	Dropdown (Pending/Approved/Rejected)	No	System	Optional filter	All
Department	Dropdown	No	Department Master	Optional filter	All Departments

Figure 30: Vacation Inquiry Search Parameters Screen Data Dictionary

Vacation Inquiry Search Results Screen - Data Dictionary

Complete field specifications for the Vacation Inquiry Search Results interface

Field Name	Data/UI Type	Is Required	Data Source	Business Rules	Default Values
Request ID	Text Display	Yes	System	Unique identifier	<i>Auto-generated</i>
Employee ID	Text Display	Yes	Employee Master	From request	<i>Auto-filled</i>
Employee Name	Text Display	Yes	Employee Master	From request	<i>Auto-filled</i>
Department	Text Display	Yes	Department Master	Employee's department	<i>Auto-filled</i>
Vacation Type	Text Display	Yes	Vacation Types	From request	<i>Auto-filled</i>
Start Date	Text Display	Yes	Employee Request	From request; Date type: Gregorian or Hijri (set to Gregorian)	<i>Auto-filled</i>
End Date	Text Display	Yes	Employee Request	From request; Date type: Gregorian or Hijri (set to Gregorian)	<i>Auto-filled</i>
Period	Text Display	Yes	System	Auto-calculated	<i>Auto-filled</i>
Status	Text Display	Yes	System	Pending, Approved, or Rejected	<i>Auto-filled</i>
Print Action	Button	No	System	Prints single transaction report	None

Figure 31: Vacation Inquiry Search Results Screen Data Dictionary

Notifications Center Screen - Data Dictionary

Complete field specifications for the Notifications Center interface

Field Name	Data/UI Type	Is Required	Data Source	Business Rules	Default Values
Action Type	Text Display	Yes	Workflow State	Shows action type (Approval, Rejection, Pending, etc.); Part of notification text	N/A
Vacation Type	Text Display	Yes	Vacation Request	Type of vacation; Part of notification text	N/A
Date Range	Text Display	Yes	Vacation Request	Start and end dates with duration; Part of notification text	N/A
Employee Name	Text Display	Yes	Employee Master	Name of employee involved; Shown in bold in notification text	N/A
Additional Context	Text Display	Conditional	Workflow History	Additional information like rejection reasons or reviewer notes	N/A
View Button	Action Button	Yes	UI Control	Opens detailed view of related request; Always enabled	View
Context Button	Action Button	Yes	UI Control	Opens My Requests or Pending Tasks based on notification type; Dynamic label	My Requests/Pending Tasks
Notification Card	Container	Yes	UI	Groups notification text and actions; Ordered by date (newest first)	N/A
Notification Visibility	System Control	Yes	User Role	Shows notifications based on user role and permissions	<i>Role-based</i>

Figure 32: Notifications Center Screen Data Dictionary

Print Single Transaction Report - Data Dictionary

Complete field specifications for the Print Single Transaction Report interface

Field Name	Data/UI Type	Is Required	Data Source	Business Rules	Default Values
Employee ID	Text Display	Yes	Employee Master	Shown in header	Auto-filled
Employee Name	Text Display	Yes	Employee Master	Shown in header	Auto-filled
Department	Text Display	Yes	Department Master	Included in report	Auto-filled
Vacation Type	Text Display	Yes	Vacation Types	Included	Auto-filled
Start Date	Text Display	Yes	Employee Request	Date type: Gregorian or Hijri (set to Gregorian); Start Date < End Date validated at request entry	Auto-filled
End Date	Text Display	Yes	Employee Request	Date type: Gregorian or Hijri (set to Gregorian)	Auto-filled
Duration	Text Display	Yes	System Calculation	End Date - Start Date + 1	Auto-filled
Notes	Text Display	No	Employee Request	Optional	Blank
Attachments	File Link	Conditional	Employee Request	Required if Sick leave	Auto-filled
Approvals	Text List	Yes	System Log	Names & job titles of approvers	Auto-filled
Footer Info	Text Display	Yes	System	Print time, page #, user who printed	Auto-filled

Figure 33: Print Single Transaction Report Data Dictionary

Print Comparative Annual Report - Data Dictionary

Complete field specifications for the Print Comparative Annual Report interface

Field Name	Data/UI Type	Is Required	Data Source	Business Rules	Default Values
Department	Text Display	Yes	Department Master	Group by Department	Auto-filled
Total Days	Number Display	Yes	System Calculation	Sum of all employees' vacation days	Auto-calculated
Details Flag	Checkbox	No	User Input	If checked, expand employees under department	Unchecked
Employee Name	Text Display (Conditional)	No	Employee Master	Shown only if Details checked	Auto-filled
Report Year	Text Display	Yes	System	Report year (e.g., 2025)	Auto-filled
Footer Info	Text Display	Yes	System	Print time, page #, user who printed	Auto-filled

Figure 34: Print Comparative Annual Report Data Dictionary

Screen-Level Data Dictionaries

11.5 Appendix C: Wireframe Images

This section contains all the wireframe images for the system's user interfaces:

11.5.1 Core Application Screens

Vacation Request

Employee Name Omar Abdelrahman	Employee ID EMP12345									
Vacation Type Annual Leave										
Start Date 08/20/2025	End Date 08/25/2025									
Period (Days) 6 days										
Notes Family vacation abroad										
Attachments Drag & drop files here <input type="button" value="Browse"/>										
Uploaded Files <table border="1"><thead><tr><th>Seq</th><th>File Name</th><th>Delete</th></tr></thead><tbody><tr><td>1</td><td>travel_itinerary.pdf</td><td>X</td></tr><tr><td>2</td><td>vacation_request_form.jpg</td><td>X</td></tr></tbody></table>		Seq	File Name	Delete	1	travel_itinerary.pdf	X	2	vacation_request_form.jpg	X
Seq	File Name	Delete								
1	travel_itinerary.pdf	X								
2	vacation_request_form.jpg	X								
<input type="button" value="Cancel"/>	<input type="button" value="Submit"/>									

Figure 35: Vacation Request Screen Wireframe

Vacation Request Screen

Vacation Cancellation Request

Employee Name	Employee ID
Omar Abdelrahman	EMP12345
<i>Cancellation must occur before the vacation start date.</i>	
Vacation Type	
Annual Leave	
Start Date	End Date
08 / 20 / 2025	08 / 25 / 2025
Period (Days)	
6 days	
Original Attachments	
Seq	File Name
1	travel_itinerary.pdf
2	vacation_request_form.jpg
Cancellation Reason	
Optional	
Cancel	Submit Cancellation

Figure 36: Vacation Cancellation Request Screen Wireframe

Vacation Cancellation Request Screen

Review Vacation Request

Employee Name	Employee ID
Omar Abdelrahman	EMP12345
Department	
Information Technology	
Vacation Type	
Annual Leave	
Start Date	End Date
08 / 28 / 2025	08 / 25 / 2025
Period (Days)	
6 days	
Notes	
Family vacation abroad	
Attachments	
Seq	File Name
1	travel_itinerary.pdf
2	vacation_request_form.jpg
Reason for Accept/Reject	
Required	

Reject Accept

Figure 37: Review Vacation Request Screen Wireframe

Review Vacation Request Screen

Review Vacation Cancellation Request

Employee Name	Employee ID
Omar Abdelrahman	EMP12345
Department	
Information Technology	
Vacation Type	
Annual Leave	
Start Date	End Date
08/20/2025	08/25/2025
Period (Days)	
6 days	
Original Notes	
Family vacation abroad	
Cancellation Reason	
Change in travel plans	
Original Attachments	
Seq	File Name
1	travel_itinerary.pdf
2	vacation_request_form.jpg
Cancellation Submitted	
2025-08-10 14:30	
Reason for Accept/Reject	
Required	
Reject Cancellation	Approve Cancellation

Figure 38: Review Vacation Cancellation Request Screen Wireframe

Review Vacation Cancellation Request Screen

My Vacation Requests				
Vacation Type	Start Date	End Date	Status	Expand
Annual Leave	08/20/2025	08/25/2025	Pending	+
Sick Leave	07/01/2025	07/03/2025	Approved	+
Emergency Leave	09/10/2025	09/11/2025	Rejected	+
Annual Leave	10/15/2025	10/20/2025	Canceled	+

Figure 39: My Vacation Requests Screen Wireframe

My Vacation Requests Screen

Pending Vacation Requests (Tasks)						
Employee ID	Name	Department	Vacation Type	Start Date	End Date	Action
EMP101	Omar Abdelrahman	IT	Annual	2025-08-20	2025-08-25	<button>View Request</button>
EMP202	Mohamed Ali	Finance	Sick	2025-09-01	2025-09-03	<button>View Request</button>

Figure 40: Pending Vacation Requests Screen Wireframe

Pending Vacation Requests Screen

Employee Vacation Inquiry - Search Parameters

From Date **To Date**

Department (Multi-select)

All Departments

IT

HR

Finance

Marketing

Operations

Sales

Employee Name or ID (Optional)

Vacation Type (Multi-select)

Annual

Sick

All

Vacation Request Status (Multi-select)

Pending

Approved

Rejected

Cancelled

All

Reset

Generate Report

Figure 41: Vacation Inquiry Search Parameters Screen Wireframe

Vacation Inquiry Search Parameters Screen

Employee Vacation Inquiry - Search Results							
Showing matching inquiry results based on search criteria							
Action		Records per page: 25 ▾					
Employee ID	Employee Name	Vacation Type	Vacation Start	Vacation End	Duration	Status	Action
EMP001	Ahmed Al-Rashid	Annual	2025-01-15	2025-01-20	6 days	Approved	<button>Print</button>
EMP002	Fatima Al-Zahra	Sick	2025-02-01	2025-02-03	3 days	Pending	<button>Print</button>
EMP003	Omar Al-Mansouri	Annual	2025-03-10	2025-03-17	8 days	Rejected	<button>Print</button>
EMP004	Sara Al-Mahmoud	Annual	2025-04-05	2025-04-09	5 days	Approved	<button>Print</button>
EMP005	Khalid Al-Rashid	Sick	2025-05-01	2025-05-02	2 days	Approved	<button>Print</button>
EMP006	Omar Al-Qasimi	Annual	2025-06-12	2025-06-16	5 days	Cancelled	<button>Print</button>
EMP007	Layla Mostafa	Sick	2025-07-03	2025-07-04	2 days	Approved	<button>Print</button>
EMP008	Hassan Adel	Annual	2025-08-20	2025-08-25	6 days	Approved	<button>Print</button>
EMP009	Youssef Nabil	Sick	2025-09-14	2025-09-15	2 days	Rejected	<button>Print</button>
EMP010	Nourhan Sameh	Annual	2025-10-01	2025-10-05	5 days	Approved	<button>Print</button>
EMP011	Ahmed Al-Rashid	Annual	2025-01-15	2025-01-20	6 days	Approved	<button>Print</button>
EMP012	Fatima Al-Zahra	Sick	2025-02-01	2025-02-03	3 days	Pending	<button>Print</button>
EMP013	Omar Al-Mansouri	Annual	2025-03-10	2025-03-17	8 days	Rejected	<button>Print</button>
EMP014	Sara Al-Mahmoud	Annual	2025-04-05	2025-04-09	5 days	Approved	<button>Print</button>
EMP015	Khalid Al-Rashid	Sick	2025-05-01	2025-05-02	2 days	Approved	<button>Print</button>
EMP016	Omar Al-Qasimi	Annual	2025-06-12	2025-06-16	5 days	Cancelled	<button>Print</button>
EMP017	Layla Mostafa	Sick	2025-07-03	2025-07-04	2 days	Approved	<button>Print</button>
EMP018	Hassan Adel	Annual	2025-08-20	2025-08-25	6 days	Approved	<button>Print</button>
EMP019	Youssef Nabil	Sick	2025-09-14	2025-09-15	2 days	Rejected	<button>Print</button>
EMP020	Nourhan Sameh	Annual	2025-10-01	2025-10-05	5 days	Approved	<button>Print</button>
EMP021	Ahmed Al-Rashid	Annual	2025-01-15	2025-01-20	6 days	Approved	<button>Print</button>
EMP022	Fatima Al-Zahra	Sick	2025-02-01	2025-02-03	3 days	Pending	<button>Print</button>

Figure 42: Vacation Inquiry Search Results Screen Wireframe

Vacation Inquiry Search Results Screen

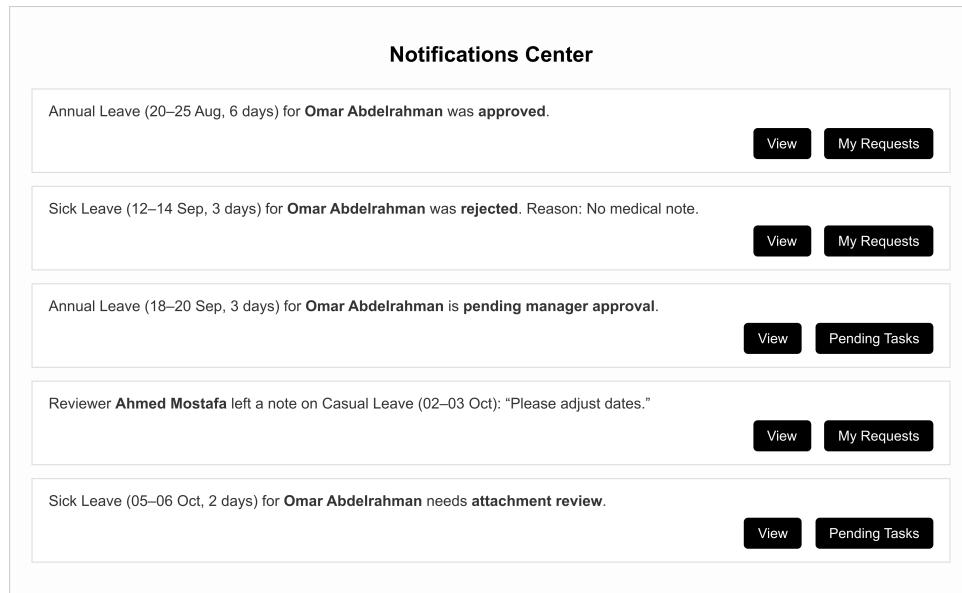


Figure 43: Notifications Center Screen Wireframe

Notifications Center Screen

Requests Center						
Pending Vacation Requests			My Vacation Requests			
Employee ID	Name	Department	Vacation Type	Start Date	End Date	Action
EMP101	Omar Abdelrahman	IT	Annual	2025-08-20	2025-08-25	<button>View Request</button>
EMP202	Mohamed Ali	Finance	Sick	2025-09-01	2025-09-03	<button>View Request</button>

Figure 44: Requests Center Screen Wireframe

Requests Center Screen

11.5.2 Report Layout Screens

VACATION TRANSACTION REPORT	
REQUEST INFORMATION	
Request Date: January 10, 2025 at 2:30 PM	
EMPLOYEE INFORMATION	
Employee ID: EMP001	Employee Name: Omar Abdelrahman
Department Name: IT Department	
VACATION DETAILS	
Vacation Type: Annual Vacation	Start Date: January 15, 2025
End Date: January 20, 2025	Duration: 5 Days
APPROVAL INFORMATION	
Names and Job Titles of Reviewers:	
<ul style="list-style-type: none">• Direct Manager: Sarah Mahmoud, IT Manager• HR Department: Khalid Hassan, HR Specialist• General Manager: Abdullah Kareem, General Manager	
Date and Time of Request Approval: January 12, 2025 at 10:30 AM	

Print Time: August 18, 2025 at 3:45 PM

Page Number: Page 1 of 1

Name of User Who Printed: Ahmad Al-Manager

Figure 45: Single Transaction Report Layout Wireframe

Single Transaction Report Layout

ANNUAL COMPARATIVE REPORT BY DEPARTMENT - 2025		
Search Parameters Used		
Department/Section: All Departments Selected	Vacation Start Date: January 1, 2025	
Vacation End Date: December 31, 2025	<input checked="" type="checkbox"/> Employees Check Box: Include employee names under departments	
Report Content		
Department Name	Total Annual Vacation Days	Remaining Balance
Information Technology • Ahmed Al-Rashid • Sara Al-Mahmoud • Omar Al-Qasimi	245 days	89 days
Human Resources • Fatima Al-Zahra • Khalid Al-Rashid	156 days	34 days
Finance • Layla Mostafa • Hassan Adel • Youssef Nabil	198 days	67 days
Marketing • Nourhan Sameh • Amira Hassan	134 days	45 days
Operations • Mohammed Ali • Rania Ahmed • Karim Omar	223 days	78 days

Print Time: August 18, 2025 at 4:15 PM

Page Number: Page 1 of 3

Name of User Who Printed: Ahmad Al-Manager

Figure 46: Annual Comparative Report Layout Wireframe

Annual Comparative Report Layout

Annual Comparative Report - Search Parameters

Generate annual comparative PDF by department

Vacation Start Date **Vacation End Date**

Department/Section (Multi-select)

All Departments
IT
HR
Finance
Marketing
Operations
Sales

Include employee names under departments

Reset **Generate Report**

Figure 47: Annual Comparative Report Search Parameters Wireframe

Annual Comparative Report Search Parameters

11.6 Appendix D: State Diagrams

The system implements comprehensive state management for vacation requests and workflows:

Vacation Request - State Diagram

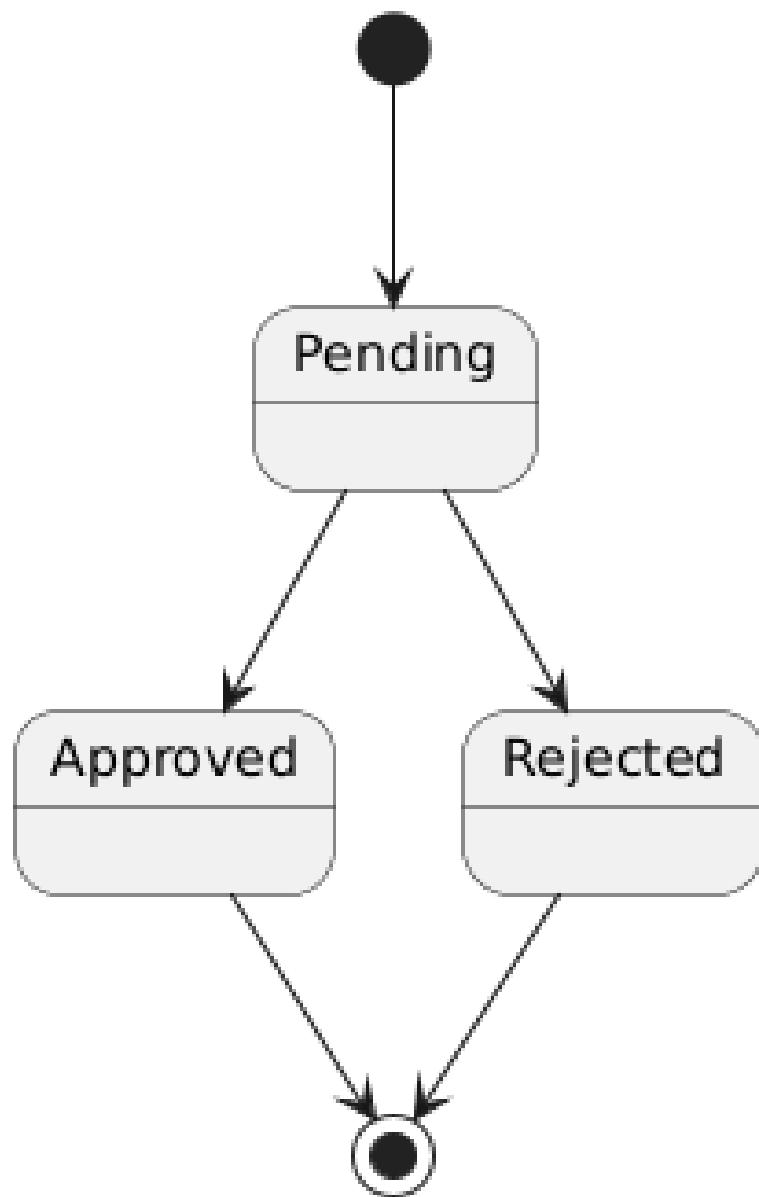


Figure 48: Vacation Request State Diagram

11.7 Appendix E: Workflow Diagrams

The system implements several key workflow processes:

11.7.1 Basic Vacation Request Flow

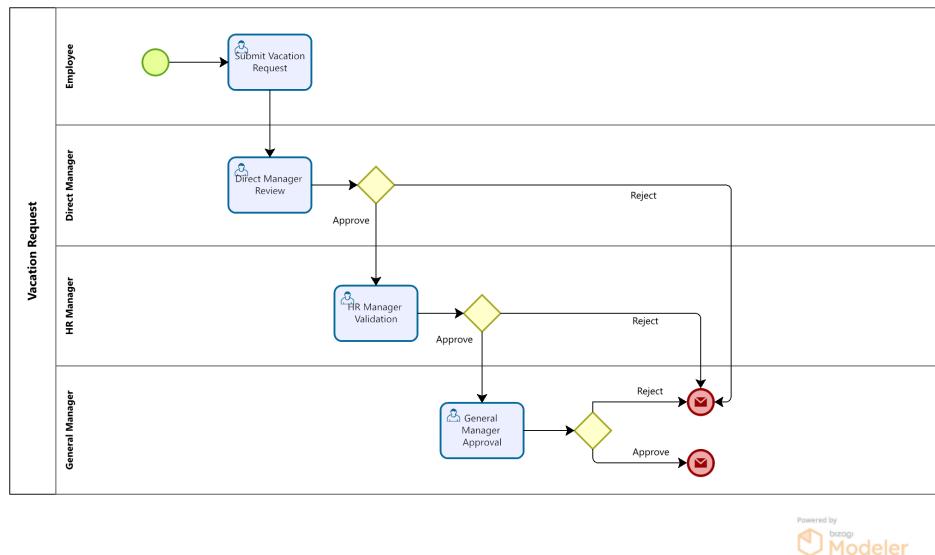
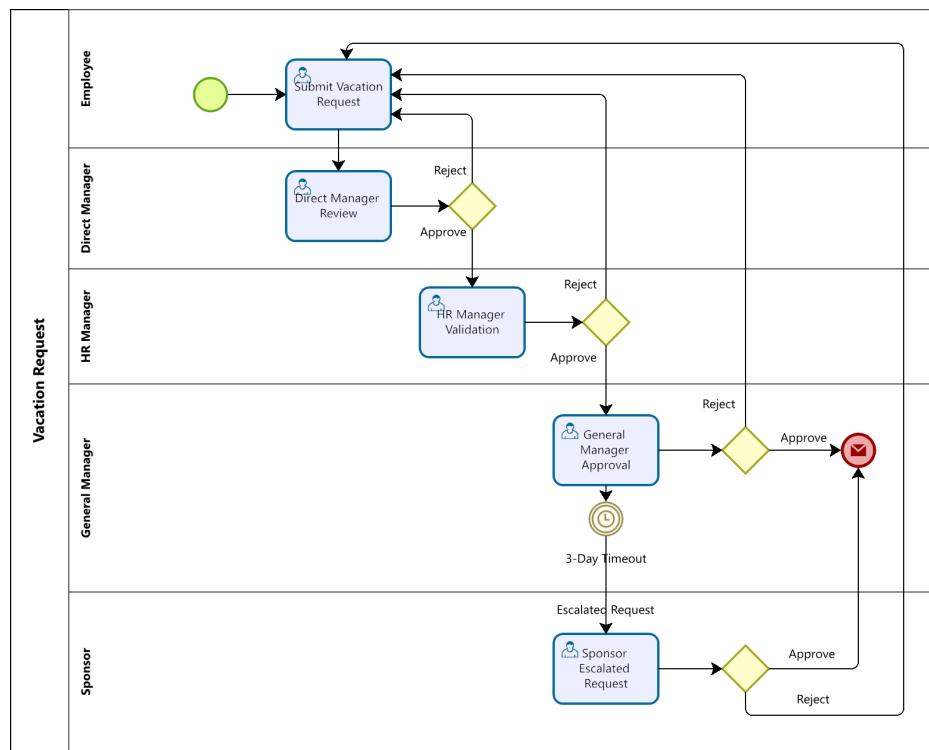


Figure 49: Basic Vacation Request Workflow

11.7.2 Escalation to Sponsor Flow



Powered by
 bizagi Modeler

Figure 50: Vacation Request Escalation to Sponsor Workflow

11.7.3 Resubmission After Rejection Flow

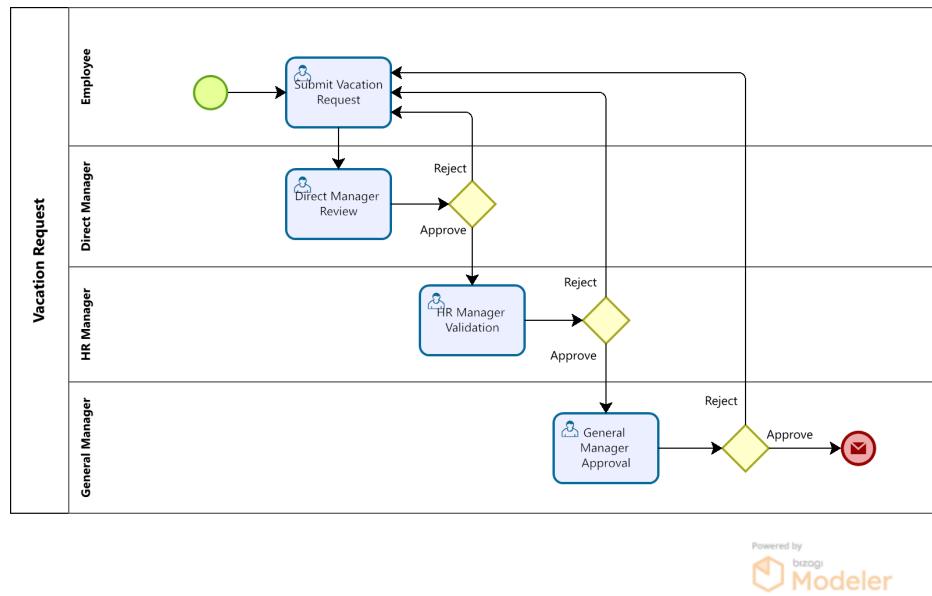


Figure 51: Vacation Request Resubmission After Rejection Workflow

11.8 Appendix F: Use Case Templates

The following image shows the standard use case template used for documenting all system use cases:

Use Case: UC-1 – Employee Submits Vacation Request

Compact use case template with actors in the summary, rules before deviations, and qualities merged into validation rules.

SUMMARY						
ID	UC-1					
Name	Employee Submits Vacation Request					
Goal	Allow an employee to submit a vacation request and route it to the manager for approval.					
Scope	HR Self-Service Portal					
Actors	Employee (primary), Manager (secondary), HR System (supporting)					
TRIGGERS						
Trigger	Employee initiates a new vacation request in the portal.					
PRE-CONDITIONS						
1	Employee is authenticated in the HR system.					
2	Employee has a non-zero leave balance.					
BASIC FLOW (MAIN SUCCESS SCENARIO)						
#	User Action	System Response				
1	Employee navigates to "Request Vacation".	System displays the vacation request form.				
2	Employee enters start date, end date, and reason.	System validates dates in real-time and shows current leave balance.				
3	Employee clicks "Submit".	System saves request, assigns a Request ID, and routes to the Manager.				
4	—	Manager receives a notification for pending approval.				
BUSINESS VALIDATION RULES						
Rule ID	Description	Condition	Message ID	Notes		
BV-001	End date must be strictly after start date.	endDate > startDate	MSG-101	Validated client & server.		
BV-002	Requested days must not exceed available leave balance.	daysRequested ≤ leaveBalance	MSG-102	Override requires HR approval.		
BV-003	Sick leave requires a medical certificate attachment.	type == "Sick"	MSG-103	Attachment is mandatory.		
BV-004	Submission should complete quickly for good UX.	submissionTime ≤ 120s	N/A	Performance/quality constraint.		
EXCEPTIONS (ERROR CONDITIONS)						
ID	At Step	Issue	Resolution			
EX-1	Step 2	Insufficient leave balance.	System blocks submission and displays an error.			
EX-2	Step 3	HR database unavailable.	System shows error, logs incident, and asks to retry later.			
ALTERNATE FLOWS (OPTIONAL VARIATIONS)						
ID	At/From Step	Description	Outcome / Resolution			
AF-1	Step 2	Employee selects dates overlapping an existing request.	System warns and allows confirm-or-adjust.			
AF-2	Step 3	Employee cancels before submission.	System discards input and returns to dashboard.			
POST-CONDITIONS						
1	Request stored with status "Pending Approval".					
2	Manager notified; can approve or reject.					
3	Employee can track status from dashboard.					
NOTES						
Note	All details consolidated in a single table for consistency and easy export/printing.					

Figure 52: Use Case Template

For complete use case specifications, refer to the All-UseCases.json document. This document contains:

- Standard Use Case Template
- Use Case Documentation Standards
- Business Rule Definition Format

- Exception Handling Documentation
- Complete specifications for all 12 use cases

11.9 Appendix G: System Architecture & Context

The system architecture details are now presented in Section 3: System Architecture and Context for better contextual understanding. This appendix contains additional technical implementation details that complement the main architecture section.

11.10 Appendix H: Technical Specifications

This appendix contains technical implementation details that are typically covered in a System Design Document:

11.10.1 Technology Stack

- **Frontend:** HTML5, CSS3, JavaScript, React/Angular
- **Backend:** Node.js/Python/Java
- **Database:** SQL Server/MySQL/PostgreSQL
- **PDF Generation:** jsPDF, iText, or similar
- **Authentication:** JWT, OAuth, or session-based
- **Workflow Engine:** Custom implementation or BPMS

11.10.2 Performance Specifications

- **Response Time:** under 3 seconds for page loads
- **Database Queries:** < 1 second for standard operations
- **PDF Generation:** < 5 seconds for standard reports
- **Concurrent Users:** Support for 100+ simultaneous users
- **File Upload:** Support for multiple file types and sizes

11.10.3 Security Specifications

- **Encryption:** AES-256 for sensitive data
- **Password Policy:** Minimum 8 characters, complexity requirements
- **Session Management:** Secure session handling with timeout
- **Input Validation:** SQL injection and XSS prevention
- **File Security:** Secure file upload and storage

11.11 Appendix I: Testing Requirements

This appendix contains testing specifications that are typically covered in a Test Plan:

11.11.1 Functional Testing

- **Unit Testing:** Individual component testing
- **Integration Testing:** Module interaction testing
- **System Testing:** End-to-end functionality testing
- **User Acceptance Testing:** Stakeholder validation
- **Workflow Testing:** Approval process validation

11.11.2 Non-Functional Testing

- **Performance Testing:** Load and stress testing
- **Security Testing:** Vulnerability assessment
- **Usability Testing:** User experience validation
- **Compatibility Testing:** Cross-browser and device testing
- **PDF Generation Testing:** Report output validation

11.12 Appendix J: Deployment and Maintenance

This appendix contains deployment and maintenance specifications that are typically covered in a Project Plan:

11.12.1 Deployment Strategy

- **Environment Setup:** Development, testing, production
- **Database Migration:** Schema creation and data migration
- **User Training:** Comprehensive training program
- **Go-Live Plan:** Phased rollout strategy
- **Integration Testing:** External system integration validation

11.12.2 Maintenance Requirements

- **Regular Updates:** Security patches and bug fixes
- **Performance Monitoring:** System health tracking
- **Backup Verification:** Regular backup testing
- **User Support:** Help desk and documentation
- **Policy Updates:** Vacation policy configuration management

11.13 Appendix K: Quality Criteria and Review Practices

This appendix articulates how the SRS adheres to quality criteria and the review process to maintain clarity and traceability.

11.13.1 Quality Criteria Mapping

- **Correct**
Complete: Centralized Business Rules (Section 4) and comprehensive traceability matrix (Section 5) ensure accuracy and coverage.
- **Clear**
Unambiguous: Quantified NFRs (Section 7) and explicit field definitions (Appendix B.2) reduce ambiguity.
- **Consistent:** Glossary (Appendix A) governs terminology across sections; references avoid duplicate definitions.
- **Feasible:** Constraints and architecture (Sections 2 and 3) bound implementation scope.
- **Traceable:** Table mappings in Section 5 link UCs, BRs, FRs, UIs, and Data.
- **Testable:** Each FR/NFR includes measurable outcomes enabling verification.
- **INVEST for Stories:** Use cases and FRs are structured to be valuable, estimable, and testable; large items are decomposed.

11.13.2 Review Techniques

- **Peer Review:** Cross-functional review sessions to identify ambiguities and inconsistencies.
- **Timed Re-read:** Authors re-read after a cooling-off period (≥ 2 weeks) to spot unclear phrasing.
- **Checklist:** Verify against quality criteria above before approval.
- **Traceability Audit:** Confirm every FR/NFR maps to UCs and BRs.
- **Terminology Audit:** Ensure all terms align with the glossary; replace "e.g." / "i.e." with full words.

12 Document Approval

12.1 Stakeholder Signatures

Name	Role	Signature & Date
	Project Manager	
	Technical Lead	
	Business Analyst	
	Stakeholder Representative	

Table 5: Document Approval Signatures

12.2 Version History

Version	Date	Changes	Author
1.0	Initial	Initial SRS Document	System Analyst
2.0	Previous	Complete rewrite with all project materials	System Analyst
2.1	Previous	Restructured for clarity, reduced redundancy, consolidated business rules	System Analyst
2.2	Previous	Added all use case images, wireframes, and data dictionary images	System Analyst
2.3	Current	Reorganized structure for logical flow, embedded key diagrams in relevant sections, added comprehensive traceability matrix	System Analyst

Table 6: Document Version History