

Software Requirement Specification

for

NexusFlow - Collaborative Workflow Manager

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1. Introduction

1.1. Purpose

This Software Requirement Specification (SRS) document describes the functional and non-functional requirements for the **NexusFlow - Collaborative Workflow Manager**. This document is intended for project stakeholders at Globex Corporation, and the design, development, and testing teams at Innovatech Solutions to understand the system's capabilities, features, and constraints. It will serve as the foundation for subsequent project phases, including design, development, testing, and deployment.

1.2. Document Conventions

- FR-XXX-YYY: Functional Requirement ID (e.g., FR-AUTH-001)
- NFR-XXX-YYY: Non-Functional Requirement ID
- The system shall... : Denotes a mandatory requirement.
- The system should... : Denotes a desirable but not mandatory requirement.
- TBD: To Be Determined.

1.3. Intended Audience and Reading Suggestions

This document is intended for:

- Project Managers (Innovatech & Globex):** For planning and tracking.
- Software Developers (Innovatech):** To understand what needs to be built.
- QA/Testers (Innovatech & Globex UAT Team):** To create test cases.
- Clients/Stakeholders (Globex Operations):** To ensure the system meets their needs. It is recommended to read the Introduction and Overall Description first, followed by specific features relevant to the reader's role.

1.4. Project Scope

The **NexusFlow - Collaborative Workflow Manager** is a web-based application designed to help teams at Globex Corporation define, execute, and monitor complex business workflows efficiently. **Key objectives include:**

- Allowing users to design reusable workflow templates.
- Enabling instantiation of workflows with clear stages and task assignments.
- Providing real-time visibility into workflow progress and bottlenecks.
- Facilitating collaboration through task comments and file attachments.
- Generating reports on workflow performance and user productivity.

Out of Scope:

- Direct integration with Globex Corporation's legacy ERP system (Phase 2 consideration).
- Advanced AI-based workflow optimization suggestions.
- Mobile-native applications (web responsiveness is in scope).
- Budgeting and financial tracking within workflows.

1.5. References

- Project Charter - NexusFlow Initiative (GC-NFI-PC-001)
- Globex Corporation - Standard Operating Procedures (GC-SOP-OPS-V3.2)
- Innovatech Solutions - UI/UX Style Guide (IS-UX-SG-V1.5)
- API Documentation - Globex Notification Service (GC-API-NOTIF-V1.1)
- IEEE Std 830-1998 - IEEE Recommended Practice for Software Requirements Specifications

2. Overall Description

2.1. Product Perspective

The **NexusFlow - Collaborative Workflow Manager** is a new, standalone system designed to replace the current manual and spreadsheet-based workflow tracking processes at Globex Corporation. It will integrate with the existing Globex Notification Service for email and SMS alerts.

2.2. Product Features

The major features of **NexusFlow** include:

- User Account Management with Role-Based Access Control
- Customizable Workflow Template Design
- Workflow Instantiation and Execution
- Multi-Stage Workflow with Task Assignments
- Real-time Progress Tracking and Dashboards
- Task Management (Status Updates, Comments, Attachments)
- Automated Notifications
- Performance Reporting and Analytics

2.3. User Classes and Characteristics

User Class	Description	Technical Expertise	Responsibilities
Workflow User	Employees who participate in workflows by completing assigned tasks.	Basic computer literacy	Viewing assigned tasks, updating task status, adding comments/attachments, following workflow instructions.
Workflow Manager	Department heads or team leads who design and oversee workflows.	Moderate	Creating/managing workflow templates, instantiating workflows, assigning tasks, monitoring progress, generating reports.
Administrator	IT personnel from Innovatech or Globex responsible for system administration.	High	Managing user accounts and roles, system configuration, backups, monitoring system health, applying updates.

2.4. Operating Environment

- The system shall be a web application accessible via Google Chrome (latest 2 versions), Mozilla Firefox (latest 2 versions), and Microsoft Edge (latest 2 versions).
- The server-side components will be hosted on Globex Corporation's private cloud infrastructure (VMware-based, running RHEL 8).
- The system will require a persistent connection to Globex Corporation's internal network.
- The application must be responsive and usable on tablet devices (screen width >= 768px).

2.5. Design and Implementation Constraints

- The backend shall be developed using Java with the Spring Boot framework.
- The frontend shall be developed using Angular (latest LTS version).
- The database shall be Microsoft SQL Server 2019 (already licensed by Globex).
- The system must adhere to Globex Corporation's IT Security Policy (GC-ITSEC-POL-V4.0).
- All user-facing text must be available in English (US).
- Development must follow an Agile (Scrum) methodology with 2-week sprints.
- The initial deployment (MVP) must be completed within 6 months.

2.6. User Documentation

The system shall be accompanied by:

- An online User Manual accessible via a "Help" link within the application.
- Contextual help (tooltips and info icons) for key features.
- A Workflow Manager's Guide for designing templates.
- An Administrator's Installation and Configuration Guide.

2.7. Assumptions and Dependencies

- Users will have access to a compatible web browser and a stable connection to the Globex internal network.
 - The Globex private cloud infrastructure will meet the specified performance and availability requirements.
 - The Globex Notification Service API (GC-API-NOTIF-V1.1) will be available and reliable for sending alerts.
 - Necessary user data for initial account creation will be provided by Globex HR in a CSV format.
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3. System Features (Functional Requirements)

3.1. Feature 1: User Authentication & Access Control

3.1.1. FR-AUTH-001: User Registration

- **Description:** The system shall allow Administrators to register new users. Self-registration is not permitted.
- **Inputs (Admin UI):** First Name, Last Name, Email Address, Initial Password, User Role.
- **Processing:**
 1. Validate input fields.
 2. Check if the email address is already registered.
 3. If validation passes and email is unique, create a new user account, hashing the password.
 4. Assign the specified role to the user.
- **Outputs:** Success message, new user account created.
- **Priority:** High

3.1.2. FR-AUTH-002: User Login

- **Description:** The system shall allow registered users to log in using their Globex corporate credentials (via SAML 2.0 SSO integration with Globex ADFS).
- **Inputs:** Redirection to Globex ADFS.
- **Processing:**
 1. Initiate SAML authentication request to Globex ADFS.
 2. Receive and validate SAML assertion.
 3. If valid, establish a user session and map ADFS roles to NexusFlow roles.
- **Outputs:** Redirection to the NexusFlow dashboard, OR error message from ADFS/NexusFlow.
- **Priority:** High

3.1.3. FR-AUTH-003: Password Reset

- **Description:** Password management is handled by Globex ADFS. NexusFlow will not have a separate password reset feature. Users will be directed to the Globex corporate password reset portal.
- **Priority:** N/A (Handled externally)

3.1.4. FR-AUTH-004: Role-Based Access Control (RBAC)

- **Description:** The system shall enforce access to features and data based on predefined user roles (Workflow User, Workflow Manager, Administrator).
- **Processing:** Before allowing any action or data access, the system shall verify the user's role and associated permissions.
- **Outputs:** Access granted or denied.
- **Priority:** High

3.2. Feature 2: Workflow Management

3.2.1. FR-WF-001: Create Workflow Template

- **Description:** Workflow Managers shall be able to create and define reusable workflow templates.
- **Inputs:** Template Name, Description, Definition of Stages, Default Assignees/Roles per Stage (optional), Task Definitions per Stage.
- **Processing:** Store template definition in the database. Validate template structure.
- **Outputs:** Saved workflow template available for instantiation.
- **Priority:** High

3.2.2. FR-WF-002: Instantiate Workflow from Template

- **Description:** Workflow Managers shall be able to start a new workflow instance from an existing template.
- **Inputs:** Selected Template, Workflow Instance Name/ID, Start Date, Overall Due Date (optional), Specific Assignees for tasks (overriding defaults).
- **Processing:** Create a new workflow instance based on the template, populate initial tasks and assignments.
- **Outputs:** New active workflow instance created and visible in dashboards.
- **Priority:** High

3.2.3. FR-WF-003: Define Workflow Stages

- **Description:** Within a workflow template, Workflow Managers shall be able to define sequential or parallel stages.
- **Inputs:** Stage Name, Stage Description, Stage Order/Dependencies, Entry/Exit Criteria (optional).
- **Processing:** Store stage definitions as part of the workflow template.
- **Outputs:** Stages are visually represented in the template designer.
- **Priority:** High

3.2.4. FR-WF-004: Assign Tasks within Stages

- **Description:** For each stage in a workflow template, Workflow Managers shall be able to define tasks and assign them to specific users or roles.
- **Inputs:** Task Title, Task Description, Default Assignee (User/Role), Estimated Duration.

- **Processing:** Store task definitions within the stage.
- **Outputs:** Tasks defined for each stage.
- **Priority:** High

3.2.5. FR-WF-005: Track Workflow Progress

- **Description:** All users shall be able to view the progress of workflow instances they are involved in or manage.
- **Inputs:** Workflow Instance ID.
- **Processing:** Retrieve current status of all stages and tasks for the workflow.
- **Outputs:** Visual representation of workflow progress (e.g., Kanban board, Gantt-like view, percentage completion).
- **Priority:** High

3.2.6. FR-WF-006: Archive Completed Workflows

- **Description:** The system shall automatically archive workflow instances 90 days after all their tasks are marked as complete.
- **Processing:** A scheduled job identifies completed workflows older than 90 days and moves them to an archive data store. Archived workflows are read-only.
- **Outputs:** Reduced load on active workflow tables, archived data still accessible for reporting by Administrators.
- **Priority:** Medium

3.3. Feature 3: Task Management

3.3.1. FR-TASK-001: View Assigned Tasks

- **Description:** Workflow Users shall be able to view a list of tasks currently assigned to them, across all active workflows.
- **Inputs:** User session.
- **Processing:** Retrieve all active, incomplete tasks assigned to the logged-in user.
- **Outputs:** A personalized task list, sortable by due date, priority, or workflow.
- **Priority:** High

3.3.2. FR-TASK-002: Update Task Status

- **Description:** Workflow Users shall be able to update the status of their assigned tasks (e.g., "To Do", "In Progress", "Completed", "Blocked").
- **Inputs:** Task ID, New Status.
- **Processing:** Validate status transition. Update task status in the database. Trigger notifications if status change impacts other tasks or workflow progression.
- **Outputs:** Task status updated in UI. Workflow progress reflects change.
- **Priority:** High

3.3.3. FR-TASK-003: Add Comments to Tasks

- **Description:** Users involved in a task (assignee, manager) shall be able to add comments to the task.
- **Inputs:** Task ID, Comment Text.
- **Processing:** Store comment with timestamp and user ID, associated with the task.
- **Outputs:** Comment visible on the task details page.
- **Priority:** Medium

3.3.4. FR-TASK-004: Attach Files to Tasks

- **Description:** Users involved in a task shall be able to attach relevant files (e.g., documents, images) to the task.
- **Inputs:** Task ID, File(s) to upload.
- **Processing:** Upload file(s) to a secure storage location. Associate file metadata (name, type, size, uploader) with the task. Max file size 10MB. Allowed types: PDF, DOCX, XLSX, JPG, PNG.
- **Outputs:** Attached files listed on task details page, downloadable by authorized users.
- **Priority:** Medium

3.4. Feature 4: Reporting & Analytics

3.4.1. FR-REP-001: Workflow Completion Report

- **Description:** Workflow Managers shall be able to generate a report on workflow completion rates and average completion times.
- **Inputs:** Date Range, Workflow Template (optional).
- **Processing:** Aggregate data from completed workflow instances.
- **Outputs:** Report displaying number of workflows started, completed, on-time, delayed, and average cycle time per template. Exportable to CSV.
- **Priority:** Medium

3.4.2. FR-REP-002: Task Overdue Report

- **Description:** Workflow Managers shall be able to view a report of all currently overdue tasks.
- **Inputs:** Workflow Template (optional), Assignee (optional).
- **Processing:** Identify all active tasks whose due date has passed and are not yet complete.
- **Outputs:** List of overdue tasks, including task name, assignee, due date, and days overdue.
- **Priority:** High

3.4.3. FR-REP-003: User Productivity Dashboard

- **Description:** Workflow Managers shall have access to a dashboard visualizing team/user productivity metrics.
- **Inputs:** Date Range, User/Team (optional).
- **Processing:** Aggregate data on tasks completed, average time per task, on-time completion rate per user/team.
- **Outputs:** Charts and key metrics displayed on a dashboard.

- **Priority:** Medium
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4. External Interface Requirements

4.1. User Interfaces (UI)

- NFR-UI-001: The system shall have a modern, clean, and intuitive user interface consistent with the Innovatech Solutions - UI/UX Style Guide (IS-UX-SG-V1.5).
- NFR-UI-002: The UI shall be responsive and provide a good user experience on desktop and tablet devices (min-width 768px).
- NFR-UI-003: Key actions (e.g., task completion, workflow initiation) shall be achievable in 3 clicks or fewer from the relevant dashboard/page.
- NFR-UI-004: The application must be accessible, adhering to WCAG 2.1 Level AA guidelines.

4.2. Hardware Interfaces

- None, beyond standard client devices (PCs, tablets) and server infrastructure.

4.3. Software Interfaces

- NFR-SI-001: The system shall integrate with Globex ADFS using SAML 2.0 for Single Sign-On (SSO).
- NFR-SI-002: The system shall use the Globex Notification Service (REST API, GC-API-NOTIF-V1.1) for sending email and SMS notifications. API key authentication will be used.
- NFR-SI-003: The system should allow administrators to export report data in CSV format.

4.4. Communications Interfaces

- NFR-CI-001: All communication between the client (browser) and the NexusFlow server shall use HTTPS (TLS 1.2 or higher).
 - NFR-CI-002: Communication between NexusFlow server and Globex Notification Service shall use HTTPS.
 - NFR-CI-003: Communication between NexusFlow server and Globex ADFS shall use HTTPS.
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5. Non-Functional Requirements

5.1. Performance Requirements

- NFR-PERF-001: Average page load time for dashboards and workflow views shall be less than 3 seconds with 50 concurrent users.
- NFR-PERF-002: The system shall support up to 200 concurrent Workflow Users and 20 Workflow Managers simultaneously without performance degradation below defined thresholds.
- NFR-PERF-003: Starting a new workflow instance from a template should complete within 5 seconds.
- NFR-PERF-004: Report generation for up to 1 year of data should complete within 30 seconds.

5.2. Security Requirements

- NFR-SEC-001: Authentication is handled via Globex ADFS (SAML 2.0). NexusFlow must securely handle SAML assertions.
- NFR-SEC-002: The system shall protect against common web vulnerabilities including OWASP Top 10 (e.g., XSS, CSRF, Insecure Deserialization). Regular penetration testing will be conducted by Globex IT Security.
- NFR-SEC-003: Role-Based Access Control shall be strictly enforced at the API and data layers.
- NFR-SEC-004: Audit logs shall be maintained for critical actions such as workflow creation/deletion, template modification, and user role changes. Logs retained for 1 year.
- NFR-SEC-005: File attachments shall be scanned for malware upon upload.
- NFR-SEC-006: Sensitive configuration data (e.g., API keys) shall be encrypted at rest and in transit.

5.3. Safety Requirements

- Not applicable for this business workflow management system.

5.4. Software Quality Attributes

5.4.1. Usability

- NFR-USAB-001: A new Workflow Manager should be able to create a simple workflow template (3 stages, 5 tasks) within 30 minutes of initial training.
- NFR-USAB-002: Error messages shall be user-friendly, explain the problem, and suggest corrective actions as per Globex UI guidelines.
- NFR-USAB-003: The system shall provide consistent navigation and terminology throughout the application.

5.4.2. Reliability

- NFR-REL-001: The system shall achieve 99.95% uptime during Globex business hours (Mon-Fri, 8 AM - 6 PM local time), excluding scheduled maintenance windows (Sunday 2 AM - 4 AM).
- NFR-REL-002: The system shall recover automatically from transient network errors when communicating with external services (ADFS, Notification Service) where possible.
- NFR-REL-003: Database backups shall be performed daily (full) and transaction logs every hour. Point-in-time recovery to within 1 hour must be possible.

5.4.3. Maintainability

- NFR-MAIN-001: The source code shall follow Innovatech Solutions' coding standards, including Javadoc/TSDoc for public APIs and complex modules.
- NFR-MAIN-002: The system shall be architected with a clear separation of concerns (e.g., presentation, business logic, data access layers).
- NFR-MAIN-003: Automated unit tests shall achieve >80% code coverage, and integration tests shall cover all critical workflow paths.
- NFR-MAIN-004: The system shall provide comprehensive application logging (INFO level for standard operations, DEBUG for troubleshooting) to aid in diagnostics.

5.4.4. Scalability

- NFR-SCAL-001: The application server architecture shall be stateless to allow for horizontal scaling by adding more instances behind a load balancer.
- NFR-SCAL-002: The system should be designed to handle a 50% growth in users and workflow instances per year for the next 3 years without requiring major architectural redesign.
- NFR-SCAL-003: Database connection pooling shall be implemented to efficiently manage database connections.

5.5. Business Rules

- BR-001: A workflow template must have at least one stage, and each stage must have at least one task.
- BR-002: A task cannot be marked "Completed" if preceding tasks in a sequential stage are not yet complete, unless overridden by a Workflow Manager.
- BR-003: User roles and their permissions are fixed as: Administrator (all privileges), Workflow Manager (create/manage templates & instances, run reports), Workflow User (view/update assigned tasks).
- BR-004: Notifications for overdue tasks are sent daily at 9 AM.

6. Other Requirements

6.1. Data Requirements

- DR-001: The system must allow Administrators to export workflow instance data (including tasks, comments, attachments metadata) in JSON format for auditing purposes.
- DR-002: Database schema changes must be managed using a migration tool (e.g., Flyway, Liquibase).
- DR-003: Personally Identifiable Information (PII) such as user names and email addresses must be handled in accordance with Globex Data Privacy Policy (GC-DPP-V2.1).
- DR-004: The system shall retain active workflow data indefinitely. Archived workflow data shall be retained for 7 years before being permanently purged.

6.2. Legal, Copyright, and Other Notices

- The system must comply with Globex Corporation's internal data handling and IT security policies.
- All third-party libraries used must be approved by Globex Legal and have commercially compatible licenses (e.g., MIT, Apache 2.0, BSD). A Bill of Materials (BOM) for software components will be maintained.
- Copyright © 2023 Innovatech Solutions & Globex Corporation. All rights reserved.

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