

GB Manufacturing Automated Equipment Checkout System (ECS)

Version 1.0

CEIS 400 Software Engineering II
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1.1.

1. Introduction

1.1. Purpose

- 1.1.1 This document outlines the software requirements for the Equipment Checkout System (ECS). This system will improve the efficiency and accuracy of the equipment check-in/check-out processes for GB Manufacturing's maintenance department, minimizing losses and enhancing accountability.

1.2. Scope

- 1.2.1 The ECS will streamline equipment management by automating check-ins and check-outs, tracking inventory, and enforcing employee accountability. The system will integrate with barcode scanners and a MySQL database while being developed in Java with Apache Ant in NetBeans.

1.3. Definitions, Acronyms, Abbreviations

- 1.3.1 ECS: Equipment Checkout System
- 1.3.2 FR: Functional Requirement
- 1.3.3 NFR: Non-Functional Requirement
- 1.3.4 SQL: Structured Query Language

1.4. References

- 1.4.1 IEEE 830 Software Requirements Specification Standard.
- 1.4.2 GB Manufacturing Internal Equipment Tracking Policies.

1.5. Overview

- 1.5.1 This document details the functional and non-functional requirements of ECS, external interfaces, constraints, and dependencies.

2. Overall Description

2.1. Product Perspective

- 2.1.1 ECS is a standalone system designed to replace the existing manual tracking method. It will integrate with GB Manufacturing's internal systems for reporting and equipment tracking.

2.2. Product Functions

- 2.2.1 Automated Equipment Check-In/Check-Out
- 2.2.2 Real-Time Inventory Tracking
- 2.2.3 Employee-Based Access Control

2.2.4 Reporting and Analytics for Equipment Usage

2.2.5 Barcode Scanner Integration

2.3. User Characteristics

2.3.1 Maintenance Employees: Use the system to borrow and return equipment.

2.3.2 Equipment Depot Staff: Manage inventory and ensure equipment availability.

2.3.3 Supervisors: Monitor tool usage and ensure compliance.

2.4. Constraints

2.4.1 The system must be accessible only within GB Manufacturing's internal network.

2.4.2 The system must comply with company security policies.

2.5. Assumptions and Dependencies

2.5.1 Users will be trained on how to use the barcode scanners.

2.5.2 The system will rely on an existing employee database for authentication

3. Specific Requirement

3.1. External Interface Requirements

3.1.1 User Interfaces

3.1.1.1. The system shall provide a web-based dashboard for tracking check-ins and check-outs.

3.1.2 Hardware Interfaces

3.1.2.1. The system shall integrate with barcode scanners to process equipment transactions.

3.1.3 Software Interfaces

3.1.3.1. The system shall connect with a MySQL database for storing transaction records.

3.1.4 Communications Interfaces

3.1.4.1. The system shall support email notifications for overdue equipment.

3.2. Functional Requirements

3.2.1 Equipment Management Subsystem

3.2.1.1. FR1: The system shall allow employees to check out equipment using barcode scanners.

3.2.1.2. FR2: The system shall maintain a record of all equipment transactions.

3.2.1.3. FR3: The system shall notify supervisors of overdue equipment.

3.2.2 Access Control Subsystem

3.2.2.1. FR4: The system shall restrict access to specific tools based on employee roles.

3.2.2.2. FR5: The system shall authenticate users before allowing equipment checkouts.

3.2.3 Notifications and Alerts Subsystem

3.2.3.1. FR6: The system shall send automated email notifications for overdue equipment.

3.2.3.2. FR7: The system shall provide real-time alerts when stock levels are low.

3.2.4 Reporting

3.2.4.1. FR5: The system shall generate reports on equipment usage and losses.

3.3. Performance Requirements

3.3.1 Standards

3.3.1.1. The system shall comply with IEEE 830 Software Requirements Specification standards.

3.3.1.2. The database shall follow ANSI SQL standards for compatibility

3.3.2 Hardware Limitations

3.3.2.1. The system shall operate on standard desktop workstations used within GB Manufacturing.

3.3.2.2. The barcode scanners must be USB or Bluetooth-compatible with the system.

3.4. Design Constraints

3.4.1.1. Availability

3.4.1.2. The system shall be available 99.9% of the time.

3.4.2 Security

3.4.2.1. The system shall encrypt sensitive employee data.

3.4.3 Maintainability

3.4.3.1. The system shall support regular software updates without downtime.

3.5. Other Requirements

3.5.1.1. The system shall log all equipment transactions for auditing purposes.

4. Appendices

4.1. System architecture diagrams

4.2. Use case diagrams

4.3. Database schema