# APG Galvaware Software System Scoping Document

APG Galvaware Team

April 3, 2025

# Contents

# Chapter 1

# Introduction

## 1.1 Purpose of the Document

This document defines the scope, objectives, detailed functional and non-functional requirements, system architecture, user roles, integration points, risk management strategies, testing procedures, and the implementation timeline for the APG Galvaware Software System. It serves as a definitive guide for stakeholders, developers, and system administrators to ensure the successful design, development, deployment, and maintenance of the system.

## 1.2 Scope of the Document

The document covers:

- Comprehensive business objectives and operational requirements.
- Detailed breakdown of system features and modules.
- Expanded requirements for client quoting, order processing, production scheduling, quality assurance, and reporting.
- In-depth description of user roles and associated permissions.
- Architectural design including data integration, security, and deployment options.
- Non-functional requirements: performance, security, scalability, and maintainability.
- A phased implementation plan with clear milestones.
- Risk analysis, testing strategies, and post-launch support.

## 1.3 Definitions, Acronyms, and Abbreviations

**APG:** The client organization.

**Galvaware:** The internal name for the software system.

**QA:** Quality Assurance.

**SLA:** Service Level Agreement.

**PO:** Purchase Order.

**UI:** User Interface.

**UAT:** User Acceptance Testing.

**2FA:** Two-Factor Authentication.

**API:** Application Programming Interface.

**ERP:** Enterprise Resource Planning.

## 1.4 References

- Internal process documentation and stakeholder interviews.
- Industry best practices for software system design.
- Standards for system integration, security protocols, and data management.

# Chapter 2

# Objectives

The primary objectives of the APG Software System are to:

1. **Streamline Operational Workflow**
   Unify job intake, processing, and dispatch across Cairns, Mackay, and the Townsville facility to enhance operational consistency and efficiency.

2. **Achieve Consistent & Fast Client Turnaround**
   Optimize production planning and real-time job tracking to ensure adherence to target turnaround times.

3. **Enhance Communication with Clients**
   Provide proactive updates via a client portal, including automated alerts for job status changes, delays, or missing data.

4. **Enable Real-Time Job Tracking & Status Updates**
   Allow internal users and clients to monitor the progress of jobs through clearly defined stages.

5. **Provide Smart Scheduling & Job Prioritization**
   Use dynamic scheduling algorithms to assign jobs based on urgency, service type, resource availability, and current workload.

6. **Support Visual Inspection & QA Logging**
   Integrate digital checklists, photo documentation, and structured data capture for quality control during various production stages.

7. **Digitize the Quoting Process**
   Streamline the quoting process with pricing integration, client-specific tiers, automated quote tracking, and conversion to production jobs.

8. **Centralize Client Management**
   Maintain comprehensive client profiles including pricing, communication history, service preferences, and custom reporting access.

9. **Track Key Business Metrics & KPIs**
   Record detailed operational data such as processed dips, zinc usage, man hours, job weights, and turnaround times.

10. **Generate Client and Management Reports**
    Offer both automated and on-demand reporting with customizable filters and scheduled distribution.

11. **Introduce AI & Machine Learning**
    Utilize AI to analyze camera inputs and historical data to automate inspections, predict job durations, and optimize resource allocation.

12. **Forecast Demand and Plan Resources**
    Employ data analytics to forecast peaks in job volume, facilitating proactive labor and inventory planning.

13. **Deliver a Customizable, Scalable Platform**
    Build a system that evolves with APG's needs by allowing customization of workflows, service types, and integration with emerging technologies.

# Chapter 3

# Detailed Functional Requirements and Features

This chapter provides an expanded view of the system's functional requirements and features across all modules.

## 3.1 Client Quoting Module

- **Quote Creation and Revision:**
  - Dynamic form inputs for service type, client pricing tier, and estimated tonnes.
  - Real-time calculation of pricing based on predefined tiers and service variables.
  - Option to save drafts and schedule future quotes.
- **Quote Cloning and Conversion:**
  - Ability to clone an existing quote, with key fields (client name, rates, expiration date, notes) editable.
  - One-click conversion from quote to job order with transfer of all relevant metadata.
- **Quote Tracking and Notifications:**
  - Automated alerts for quote expiry, pending approvals, and conversion deadlines.
  - Audit trail logging all changes made to quotes.

## 3.2 Job Intake & Order Processing

- **Multi-Channel Order Entry:**
  - Support for orders submitted via the client portal, depot kiosks, and manual input by staff.
  - Integrated validation rules to ensure completeness and accuracy of order data.
- **Order Validation and Inspection:**
  - Automated checklists to verify incoming order data and initial quality inspection.
  - Mandatory image uploads and documentation for first-level inspection.
- **Data Enrichment:**

  - Automatic assignment of job weight, classification of service type, and additional metadata from integrated sensors (if available).

## 3.3 Production Workflow & Scheduling

- **Dynamic Job Tracking:**
  - Real-time tracking of jobs through multiple production stages.
  - Visual dashboards displaying current status, bottlenecks, and estimated completion times.
- **Smart Scheduling:**
  - Scheduling engine that prioritizes jobs based on urgency, capacity constraints (e.g., zinc bath availability), and manpower.
  - Historical data analysis to forecast processing times and prevent scheduling conflicts.
- **Transport Manifest Management:**
  - **Inbound Manifests:** Group jobs from Cairns and Mackay, generate detailed manifests with client and job details, and integrate scanning for loading confirmation.
  - **Outbound Manifests:** Organize finished goods for return transport, generate return manifests, and update job status based on real-time scanning and notifications.
- **Load Scheduling Integration:**
  - Use AI-driven analysis of historical load data to recommend optimal job grouping.
  - Allow manual overrides by depot managers with audit trail logging.

## 3.4 Quality Assurance (QA) Logging

- **Multi-Level QA Checklists:**
  - Structured checklists for initial inspection, in-process quality checks, and final QA.
  - Configurable QA levels (e.g., Level 1, 2, 3) with tailored criteria.
- **Documentation and Non-Conformance:**
  - Capture and store high-resolution images, inspection notes, and non-conformance flags.
  - Automated escalation workflows for jobs failing to meet quality standards.
- **Historical Data Analysis:**
  - Maintain a searchable database of QA logs for trend analysis and process improvement.

## 3.5 Client Portal

- **User Authentication and Dashboard:**
  - Secure login with options for 2FA and role-based access.
  - Personalized dashboard with order history, real-time job tracking, and notifications.
- **Order Management and Communication:**
  - Ability for clients to submit new orders, modify existing orders, and track order progress using PO or Work Order numbers.
  - Direct messaging and notification system for order status updates and clarifications.
- **Reporting and Data Export:**
  - Access to downloadable reports on past orders, invoicing, and performance metrics.
  - Customizable views and filters for client-specific reporting.

## 3.6 Communication & Commenting System

- **Threaded Commenting:**
  - Internal and external discussion threads associated with each job.
  - Capability to tag users, attach files, and flag critical issues (e.g., Hold for Clarification, Requires QA Escalation).
- **Notification Integration:**
  - Automated email and in-app notifications for updates in comment threads.
  - Real-time alerts on changes that require immediate attention.

## 3.7 Reporting & Dashboard Analytics

- **Real-Time Dashboards:**
  - Visual displays for operational metrics including production status, KPI tracking (dips, tonnes processed, zinc usage, man hours), and transport efficiency.
  - Customizable dashboards for different user roles (e.g., operations, management, finance).
- **Automated and Custom Reports:**
  - Scheduled report generation with configurable frequency (daily, weekly, monthly).
  - Advanced filtering options and export capabilities (CSV, PDF) for both client and management reports.

## 3.8 AI & Forecasting Tools

- **Visual Inspection Automation:**
  - Integration of camera systems for real-time visual data capture during inspections.
  - Machine learning algorithms to identify defects or anomalies automatically.
- **Predictive Analytics:**
  - Use historical job data to predict processing times and identify potential delays.
  - Forecast demand trends to aid in labor and resource planning.
- **Adaptive Scheduling:**
  - AI-based recommendations for dynamic rescheduling and load balancing.
  - Continuous learning from operational data to optimize future scheduling.

## 3.9 Administration & Permissions

- **User Management:**
  - Role-based access controls with customizable permissions.
  - Detailed audit logs of user actions and system changes.
- **System Configuration:**
  - Administrative interfaces to configure service types, pricing tiers, QA levels, and notification rules.
  - Capability to update and maintain system settings without downtime.
- **Security Administration:**
  - Enforced password policies, session management, and 2FA.
  - Regular security audits, automated vulnerability scanning, and comprehensive backup routines.

# Chapter 4

# System Architecture

The APG Software System is designed for secure, efficient, and scalable operations.

## 4.1 Deployment & Hosting

- Primary deployment on APG's on-premise servers.
- Option for future migration to cloud platforms (e.g., AWS, Azure) to enhance scalability and accessibility.

## 4.2 Access & Devices

- Web-based access through modern browsers optimized for desktop, tablet, and mobile devices.
- Real-time data synchronization across all operational locations.

## 4.3 Modular System Design

- **Modules:**
  - Client Quoting Module
  - Job Intake & Order Processing
  - Production Scheduling & Transport Management
  - Quality Assurance Logging
  - Client Portal & Communication
  - Reporting & Dashboard Analytics
  - Administration & User Management
  - AI & Forecasting Tools (Future Enhancements)

## 4.4 Data & Integrations

- Centralized relational database with high availability.
- Integration with existing ERP and accounting systems using standardized data exchange formats (JSON, XML).

- Capability for future integration with IoT sensors and external analytics platforms.

## 4.5 Security & Backup

- End-to-end encryption for data at rest and in transit.
- Daily automated backups and comprehensive disaster recovery plans.
- Role-based access controls with mandatory two-factor authentication.
- Regular security audits and compliance with industry standards.

# Chapter 5

# Non-Functional Requirements

## 5.1 Performance

- Support a minimum of 100 concurrent users with sub-2-second response times for key operations.
- Real-time updates with minimal latency across all modules.

## 5.2 Security

- Encryption for data storage and secure transmission protocols.
- Strict role-based access with two-factor authentication.
- Regular vulnerability assessments and penetration testing.

## 5.3 Scalability and Maintainability

- Modular design for easy feature expansion and integration.
- Well-documented codebase and automated testing frameworks to ensure maintainability.
- System architecture designed to scale with increasing data volume and user load.

## 5.4 Availability and Reliability

- Target system uptime of 99.5% or higher.
- Robust backup and disaster recovery processes.
- Redundant systems and failover mechanisms in place.

# Chapter 6

# Integration and Interoperability

- **ERP and Financial Systems:** Seamless integration with existing accounting software.
- **API Endpoints:** Open APIs for third-party integration and data exchange.
- **Data Formats:** Support for standardized formats such as JSON and XML for interoperability.

# Chapter 7

# Risk Analysis and Mitigation

## 7.1 Identified Risks

- **Integration Challenges:** Compatibility issues with legacy systems.
- **User Adoption:** Resistance to new technology and process changes.
- **Security Vulnerabilities:** Risks of data breaches and unauthorized access.
- **Scope Creep:** Unplanned feature additions impacting timelines and budgets.

## 7.2 Mitigation Strategies

- Regular integration testing and pilot programs.
- Comprehensive training and support initiatives.
- Periodic security audits and prompt updates to address vulnerabilities.
- Strict change management protocols to control scope.

# Chapter 8

# Testing and Quality Assurance

- **Unit Testing:** Extensive unit tests for each module.
- **Integration Testing:** Verify seamless interaction between modules and external systems.
- **System Testing:** End-to-end testing with realistic data scenarios.
- **User Acceptance Testing (UAT):** Involvement of pilot users to validate business requirements.

# Chapter 9

# Training, Documentation, and Support

- **Training:** Comprehensive training sessions for administrators, depot staff, and QA teams; supplemented by online tutorials and user manuals.
- **Documentation:** Detailed technical documentation and user guides available both in print and online.
- **Support:** Ongoing technical support via a dedicated helpdesk, regular system updates, and an online knowledge base.

# Chapter 10

# Implementation Timeline & Milestones

The project will be executed in the following phases:

## 10.1 Phase 1 – Discovery & Scoping (1–2 weeks)

- Finalize features and business workflows.
- Confirm user roles, permissions, and integration requirements.
- Document detailed technical and operational requirements.

## 10.2 Phase 2 – Design & Prototyping (2–3 weeks)

- Develop detailed UI mockups and system flow diagrams.
- Validate design with APG stakeholders.
- Finalize technical stack and hosting architecture.

## 10.3 Phase 3 – Core Development (6–8 weeks)

- Build and test core modules including quoting, job intake, scheduling, transport manifests, QA, and dashboard analytics.
- Configure role-based access and depot-specific workflows.

## 10.4 Phase 4 – Testing & Refinement (2–3 weeks)

- Conduct comprehensive system testing with pilot data.
- Perform QA, bug fixing, and performance optimization.
- Adjust workflows and UI based on user feedback.

## 10.5 Phase 5 – Training & Go-Live (1–2 weeks)

- Execute hands-on training sessions for all user groups.
- Deploy the system into the live production environment.
- Provide detailed user manuals and onboarding support.

## 10.6 Phase 6 – Post-Launch Support & Future Planning

- Provide ongoing technical support and system maintenance.
- Monitor system performance and user adoption.
- Plan for future enhancements such as mobile apps and advanced AI capabilities.

# Chapter 11

# Appendices

## 11.1 Glossary

**API:** Application Programming Interface.

**ERP:** Enterprise Resource Planning.

**UAT:** User Acceptance Testing.

**2FA:** Two-Factor Authentication.

## 11.2 Change Log

- **v1.0** – Initial version with core scoping, objectives, and functional requirements.
- **v1.1** – Expanded functional requirements, non-functional requirements, and integration details.
- **v1.2** – Enhanced testing, training, and support sections with detailed feature descriptions.

## 11.3 Contact Information

- **Project Manager:** [Name, Email, Phone]
- **Technical Lead:** [Name, Email, Phone]
- **Support:** [Support Email, Hotline Number]