

**North South University**

Department of Electrical & Computer Engineering

**Product Requirements Document: Synapse CRM**

**Course Code: CSE-327**

**Course Name: Software Engineering**

**Section: 02**

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## 1.0 Introduction and Vision

### 1.1 Product Vision

Synapse represents a paradigm shift in customer relationship management by delivering an intelligent, adaptable platform that grows with businesses. Our vision is to create a CRM that serves as the central nervous system for customer-facing operations, seamlessly blending robust data management with artificial intelligence to anticipate needs and automate workflows. The platform will evolve from a comprehensive core CRM in Phase 1 to a truly agentic system in Phase 2, where the CRM proactively manages customer relationships rather than merely recording them.

### 1.2 Target Market & Audience

The platform is engineered to serve diverse organizational structures and business models:

- **Enterprise B2B Organizations:** Technology companies, consulting firms, and professional services managing complex, multi-stage sales cycles with lengthy decision processes and multiple stakeholders.
- **High-Volume B2C Operations:** Retail chains, service providers, and e-commerce businesses requiring efficient management of thousands of customer interactions and support requests.
- **Small to Medium Enterprises:** Growing businesses needing enterprise-grade CRM capabilities without enterprise-level complexity or cost.
- **Distributed & Remote Teams:** Organizations with geographically dispersed sales and support teams requiring real-time collaboration and centralized customer intelligence
- **Professional Freelancers:** Individual consultants, developers, and creatives managing client portfolios and project pipelines.

### 1.3 The Problem Statement

Contemporary businesses face three fundamental challenges in customer relationship management:

**Data Fragmentation:** Customer information resides in siloed systems - emails in Gmail, meetings in Calendar, calls in VoIP systems, and notes in various applications. This fragmentation prevents a unified view of customer relationships and creates operational inefficiencies.

**Process Rigidity:** Most CRM solutions enforce predetermined workflows that don't align with how businesses actually operate. Companies are forced to adapt their processes to software limitations rather than having software that adapts to their unique needs.

**Administrative Overhead:** Sales and support teams spend significant time on manual data entry, meeting preparation, and status updates - time that should be spent building customer relationships and driving revenue.

Synapse addresses these challenges through a unified platform with customizable workflows and intelligent automation, transforming CRM from a system of record to a system of action.

## 2.0 Guiding Principles & Goals

### 2.1 Product Goals

#### 1. Unified Customer Intelligence Hub

- Consolidate all customer interactions, communications, and relationship data into a single, accessible platform.
- Provide 360-degree customer visibility across sales, support, and marketing touchpoints.

#### 2. Adaptable Process Framework

- Support completely customizable sales pipelines, support workflows, and data models.
- Enable business process configuration without technical expertise or development resources.
- Provide templates for common business models while maintaining full customization capabilities.

#### 3. Intelligent Automation Engine

- Reduce manual data entry through AI-powered automation and integration.
- Provide proactive insights and recommendations based on customer behavior patterns.
- Automate routine tasks while maintaining human oversight for critical decisions.

#### 4. Seamless Ecosystem Integration

- Connect with industry-leading tools through robust API architecture.
- Ensure data synchronization and workflow continuity across integrated platforms.
- Provide integration templates for common business tool combinations.

### 2.2 Design Principles

- **Configuration Over Code:** Business users should be able to customize pipelines, fields, and workflows through intuitive interfaces without requiring technical development.
- **Mobile-First Experience:** All core functionality must be accessible and optimized for mobile devices, recognizing that modern business happens increasingly on the go.
- **Progressive Disclosure:** Complex functionality should be revealed gradually based on user sophistication and business needs, avoiding overwhelming new users.
- **Security by Design:** Multi-tenant isolation, role-based access control, and data encryption must be foundational architecture elements, not afterthoughts.
- **API-First Architecture:** All platform capabilities should be exposed through well-documented APIs, enabling extensibility and integration from day one.

## **3.0 User Personas**

### **3.1 Sales Professional - Alex Chen**

**Background:** 32-year-old account executive at a SaaS company, managing 25+ active opportunities across different stages of the sales cycle. Works remotely 3 days per week and relies heavily on mobile access.

#### **Daily Challenges:**

- Spending 2-3 hours daily on manual data entry across CRM, email, and calendar.
- Losing context between customer interactions due to information fragmentation.
- Inefficient meeting preparation requiring manual research across multiple systems.
- Difficulty prioritizing opportunities based on actual engagement signals.

#### **Synapse Solution Benefits:**

- Automated activity capture from emails, calls, and meetings eliminates manual logging.
- AI-powered meeting preparation provides comprehensive briefings in seconds.
- Mobile-optimized interface enables CRM access during customer visits and travel.
- Intelligent pipeline analytics highlight priorities based on engagement patterns.

#### **Key Usage Patterns:**

- Morning pipeline review via mobile app during commute.
- Automated meeting note capture and summary generation.
- Natural language updates via conversational AI interface.
- Real-time collaboration with sales support team.

### **3.2 Sales Manager - Maria Rodriguez**

**Background:** 40-year-old regional sales manager overseeing a team of 8 account executives across three territories. Responsible for forecasting, coaching, and resource allocation.

#### **Management Challenges:**

- Lack of real-time visibility into team activities and pipeline health.
- Manual aggregation of performance data from multiple sources.
- Inaccurate forecasting due to inconsistent pipeline data quality.
- Difficulty identifying coaching opportunities and performance trends.

#### **Synapse Solution Benefits:**

- Consolidated team dashboard with real-time performance metrics.
- Automated forecasting based on historical data and the current pipeline.
- Coaching insights highlighting skill gaps and improvement opportunities.
- Customizable reporting for different stakeholder requirements.

## **Key Usage Patterns:**

- Daily team performance review via executive dashboard.
- Weekly pipeline review and forecasting sessions.
- Individual coaching based on AI-identified improvement opportunities.
- Resource allocation based on territory performance analytics.

## **4.0 Phase 1: Core CRM Platform (Weeks 1-2)**

### **4.1 Core Architecture & Security**

#### **Multi-Tenant Data Isolation:**

- Schema-level database separation ensuring complete data isolation between tenants.
- Tenant-specific encryption keys for sensitive customer data.
- Cross-tenant access prevention through middleware validation layers.
- Resource quota management and performance isolation.

#### **Authentication & Authorization:**

- Google OAuth 2.0 integration for streamlined user onboarding.
- JSON Web Token (JWT) implementation for stateless authentication.
- Role-Based Access Control (RBAC) with granular permission settings.
- Session management with configurable timeout policies.

## **4.2 Sales Pipeline Management**

### **Custom Pipeline Configuration:**

- Visual pipeline builder with drag-and-drop stage configuration.
- Unlimited custom stages with configurable properties and rules.
- Stage-specific automation triggers and validation rules.
- Pipeline templates for common business models (SaaS, Services, E-commerce).

### **Contact & Lead Management:**

- Comprehensive contact profiles with unlimited custom fields.
- Bulk import from CSV/Excel with intelligent field mapping.
- Duplicate detection and merge capabilities.
- Contact enrichment through integrated data sources.

### **Interaction Intelligence:**

- Unified timeline of all customer interactions across channels.
- Automated activity capture from integrated services.
- Interaction scoring based on engagement quality and recency.
- Relationship mapping for complex B2B account structures.

## 4.3 Customer Service Operations

### Integrated Ticketing System:

- Open-source issue tracker integration with bi-directional sync.
- Customizable ticket status workflows and SLA policies.
- Automated ticket routing based on skill, workload, and priority.
- Customer satisfaction tracking and trend analysis.

### Service Context Integration:

- Full sales history and interaction context available to support teams.
- Intelligent case deflection through knowledge base integration.
- Customer health scoring to identify at-risk accounts.
- Escalation management with audit trail and approval workflows.

## 4.4 Third-Party Integrations

Service	Integration Scope	Data Synchronization
Gmail & Google Workspace	Email tracking, contact sync, calendar integration	Bi-directional contact sync, email thread capture, event creation
LinkedIn Sales Navigator	Lead sourcing, profile enrichment, message tracking	Contact creation from profiles, interaction logging, social signals
AI Meeting Assistants	Automatic transcription, summary generation, action item extraction	Meeting notes association
VoIP Services	Click-to-call, call recording, and automatic call logging	Call duration tracking, transcript storage, outcome classification
Open-Source Issue Tracker	Ticket synchronization, status updates, assignment tracking	Bi-directional ticket state management, comment synchronization

## 5.0 Phase 2: Agentic CRM Intelligence (Weeks 3-5)

### 5.1 Conversational AI Interface

#### Natural Language Processing:

- Context-aware command interpretation with entity recognition.
- Multi-turn conversation management, maintaining context across interactions.
- Intent classification for accurate action mapping.
- Sentiment analysis for customer communication evaluation.

### **Intelligent Query Capabilities:**

- Complex data queries across multiple entities and relationships.
- Temporal analysis and trend identification through natural language.
- Comparative analysis between time periods, teams, or products.
- Predictive insights based on historical patterns and current data.

### **Cross-Platform Intelligence:**

- Unified search across CRM data and integrated service content.
- Information synthesis from emails, calls, meetings, and support tickets.
- Relationship intelligence mapping organizational structures and influence.
- Recommendation engine suggesting next best actions.

## **5.2 Proactive Automation**

### **Automated Meeting Intelligence:**

- Pre-meeting briefing generation combining historical context and recent activities.
- Participant background compilation from internal and external sources.
- Discussion guide creation based on opportunity stage and customer profile.
- Post-meeting action item extraction and assignment.

### **Intelligent Pipeline Management:**

- Automatic deal stage progression based on engagement signals.
- Stall detection and intervention recommendations.
- Priority scoring combining explicit data and implicit signals.
- Churn risk identification and mitigation suggestions.

### **Workflow Automation:**

- Custom automation rules based on data changes and time triggers.
- Multi-step workflow orchestration across integrated services.
- Conditional logic supporting complex business rules.
- Approval workflow management with escalation paths.

## **5.3 Advanced Integration Capabilities**

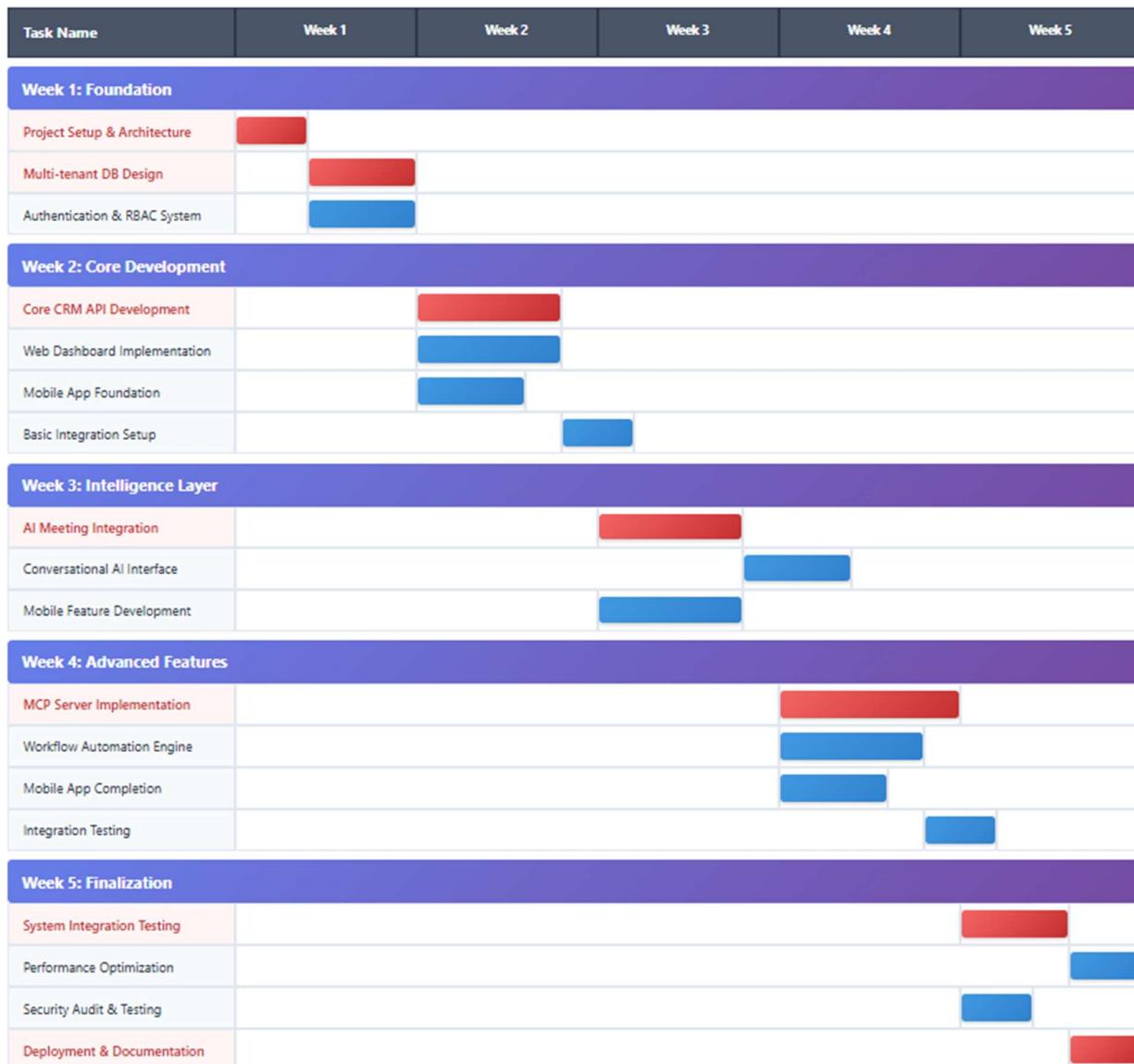
### **MCP Server Implementation:**

- Model Control Protocol server for standardized AI tool execution.
- Plugin architecture for custom tool development and integration.
- Tool discovery and capability negotiation.
- Execution monitoring and result validation.

## Intelligent Notification System:

- Context-aware alerts based on customer behavior patterns.
- Priority-based notification routing across channels.
- Smart summarization reduces notification fatigue.
- Actionable notifications with one-click responses.

## 6.0 Implementation Timeline



## **6.1 Week 1-2 Deliverables: Core Platform**

### **Database & Backend:**

- Multi-tenant PostgreSQL schema with complete data isolation.
- Google OAuth 2.0 integration with JWT token management.
- RESTful APIs for contacts, pipelines, and user management.
- Role-based permission system with granular access control.

### **Frontend & Mobile:**

- Responsive web dashboard with pipeline visualization.
- Contact management interface with bulk operations.
- Mobile app authentication and basic navigation.
- Real-time data synchronization between web and mobile.

### **Integrations:**

- Gmail OAuth connection and email tracking.
- Google Calendar integration for meeting management.
- Basic external service integration.

## **6.2 Week 3-5 Deliverables: Intelligent Features**

### **AI Capabilities:**

- Meeting transcription and summary generation.
- Natural language query processing.
- Automated activity classification and logging.
- Intelligent contact enrichment

### **Mobile Experience:**

- Full CRUD operations in a mobile application.
- Offline data synchronization and conflict resolution.
- Push notifications for important updates.
- Mobile-optimized analytics and reporting.

### **Automation Engine:**

- MCP server with core tool implementations.
- Workflow automation builder and executor.
- Proactive notification and alert system.
- Cross-service automation orchestration.

## **7.0 Features Out of Scope**

### **7.1 Excluded Capabilities**

#### **Industry-Specific Functionality:**

- Construction project management and bidding workflows.
- Healthcare patient records and HIPAA compliance features.
- Legal case management and document automation.
- Real estate property management and MLS integration.

#### **Proprietary Tool Replacements:**

- Email client with full composition and management capabilities.
- Calendar application with scheduling and availability management.
- Document editing and collaboration platform.
- Video conferencing and webinar hosting services.

#### **Advanced Enterprise Systems:**

- Complex commission calculation and compensation management.
- Advanced accounting and ERP integration.
- Custom development and scripting environment.
- White-labeling and rebranding capabilities.

### **7.2 Future Roadmap Considerations**

- Third-party app marketplace and integration ecosystem.
- Advanced predictive analytics and machine learning models.
- Cross-platform mobile applications (iOS, desktop).
- Advanced workflow automation with custom logic.
- Marketplace for pre-built automation templates.
- Advanced analytics and custom reporting builder.