

AI BrainFrame System

Functional Requirements Document (FRD)

Document Information

Project: AI BrainFrame Field Service Intelligence Platform

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Classification: Confidential - Executive Presentation

1. Executive Summary

1.1 Project Vision

AI BrainFrame is an intelligent field service platform designed to revolutionize fire alarm and access control system troubleshooting, maintenance, and compliance. The system provides real-time AI-powered assistance to field technicians through mobile and web applications, dramatically reducing service time, improving accuracy, and ensuring regulatory compliance nationwide.

1.2 Business Objectives

- **Reduce service call time by 40%** through intelligent troubleshooting assistance
- **Improve first-call resolution rates to 95%+** via comprehensive knowledge access
- **Ensure 100% code compliance** across all 50 states
- **Accelerate technician training** from months to weeks
- **Create competitive advantage** in the field service industry

1.3 Target Market

- Fire alarm and access control service companies
 - Large facilities management organizations
 - Government and institutional clients
 - Equipment manufacturers seeking service excellence
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2. System Overview

2.1 Core Components

- **Mobile Application** - Primary field technician interface

- **Web Dashboard** - Management and office interface
- **AI Engine** - Natural language processing and computer vision
- **Knowledge Management System** - Centralized document and solution repository
- **Job Management Platform** - Work order integration and tracking
- **Compliance Engine** - Real-time code and regulation checking

2.2 Technology Architecture

- **Frontend:** React Native (mobile), React.js (web)
 - **Backend:** Python FastAPI microservices architecture
 - **AI/ML:** Open-source LLM with fine-tuning, computer vision models
 - **Database:** PostgreSQL with vector database for embeddings
 - **Infrastructure:** Scalable cloud deployment with edge computing capabilities
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3. User Personas

3.1 Primary Users

Field Technician (Primary)

- Experience: Entry-level to expert (1-20+ years)
- Needs: Quick answers, visual guidance, step-by-step procedures
- Environment: On-site, potentially hazardous conditions, time-sensitive
- Devices: Smartphone, tablet, future AR glasses

Service Manager

- Responsibilities: Oversight, quality control, resource allocation
- Needs: Performance analytics, compliance monitoring, team coordination
- Environment: Office and field supervision

Company Owner/Executive

- Focus: Business growth, competitive advantage, ROI
- Needs: Performance metrics, cost reduction, market differentiation

3.2 Secondary Users

Training Coordinator

- Role: New technician onboarding and continuing education
- Needs: Training modules, competency tracking, knowledge gaps identification

Compliance Officer

- Role: Regulatory adherence, audit preparation
 - Needs: Code compliance tracking, violation alerts, documentation
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4. Functional Requirements

4.1 Core AI Assistant Functions

FR-001: Natural Language Query Processing

- System shall accept voice and text queries in natural language
- System shall understand context of current job and user history
- System shall provide relevant, actionable responses within 3 seconds
- System shall handle technical terminology and abbreviations

FR-002: Multi-Modal Input Processing

- System shall accept and analyze photographs of equipment and installations
- System shall process audio recordings of equipment sounds
- System shall analyze video feeds for real-time troubleshooting
- System shall extract text from photographed documents and labels

FR-003: Intelligent Troubleshooting Assistance

- System shall provide step-by-step diagnostic procedures
- System shall adapt guidance based on user responses and findings
- System shall escalate complex issues to human experts
- System shall learn from successful resolution patterns

4.2 Knowledge Management

FR-004: Document Repository Management

- System shall store and index equipment manuals, specs, and procedures
- System shall maintain version control for all documents
- System shall provide intelligent search across all content types

- System shall auto-categorize uploaded documents

FR-005: Solution Database

- System shall capture and store successful problem resolutions
- System shall link solutions to specific equipment and issue types
- System shall enable solution sharing across technician teams
- System shall rank solutions by success rate and relevance

FR-006: Code Compliance Database

- System shall maintain current codes for all 50 states
- System shall provide location-aware compliance checking
- System shall alert to code violations in real-time
- System shall update automatically when regulations change

4.3 Job Management Integration

FR-007: Job-Centric Data Organization

- System shall organize all documents, photos, and conversations by job number
- System shall provide pre-job briefings with relevant documentation
- System shall track job progress and completion status
- System shall generate automatic job documentation

FR-008: Real-Time Job Support

- System shall provide contextual assistance based on current job type
- System shall suggest relevant procedures and check procedures
- System shall enable real-time collaboration with remote experts
- System shall capture time stamps for all activities

4.4 User Management & Personalization

FR-009: User Authentication & Authorization

- System shall provide secure login with role-based access control
- System shall maintain individual user profiles and preferences
- System shall track user competencies and certifications
- System shall provide company-level data segregation

FR-010: Conversation Memory & History

- System shall maintain complete conversation history per user
- System shall recall previous solutions for similar issues
- System shall provide conversation search and retrieval
- System shall link conversations to job outcomes

4.5 Learning & Improvement

FR-011: Continuous Learning Engine

- System shall learn from user feedback and corrections
- System shall improve responses based on successful outcomes
- System shall identify knowledge gaps and suggest content needs
- System shall adapt to company-specific procedures and preferences

FR-012: Performance Analytics

- System shall track resolution times and success rates
- System shall identify most common issues and solutions
- System shall provide technician performance insights
- System shall generate business intelligence reports

4.6 Integration Capabilities

FR-013: External System Integration

- System shall integrate with existing CRM/job dispatch systems
- System shall connect to manufacturer databases and APIs
- System shall interface with parts inventory and ordering systems
- System shall sync with customer management platforms

FR-014: Parts & Inventory Management

- System shall identify parts from images and descriptions
 - System shall check local inventory and supplier availability
 - System shall facilitate parts ordering directly from the field
 - System shall track parts usage and costs per job
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5. Non-Functional Requirements

5.1 Performance Requirements

- **Response Time:** AI responses within 3 seconds for 95% of queries
- **Availability:** 99.9% uptime with 24/7 monitoring
- **Scalability:** Support 10,000+ concurrent users
- **Offline Capability:** Core functions available without internet connectivity

5.2 Security Requirements

- **Data Encryption:** All data encrypted in transit and at rest
- **Access Control:** Role-based permissions with audit trails
- **Compliance:** SOC 2 Type II, GDPR, and industry-specific requirements
- **Privacy:** Customer data isolation and protection

5.3 Usability Requirements

- **Mobile Responsiveness:** Optimized for smartphones and tablets in field conditions
 - **Accessibility:** WCAG 2.1 AA compliance for users with disabilities
 - **Language Support:** Initially English, expandable to multiple languages
 - **Training Time:** New users productive within 30 minutes
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6. Success Criteria & KPIs

6.1 Business Metrics

- **Service Time Reduction:** 40% decrease in average service call duration
- **First-Call Resolution:** Achieve 95%+ resolution rate
- **Customer Satisfaction:** Maintain 4.8+ star rating
- **Revenue Impact:** 25% increase in service capacity per technician

6.2 Technical Metrics

- **AI Accuracy:** 90%+ correct responses for technical queries
- **System Adoption:** 85%+ daily active usage by field technicians
- **Knowledge Growth:** 500+ new solutions captured monthly
- **Compliance Rate:** 100% code compliance across all jobs

6.3 User Experience Metrics

- **User Satisfaction:** 4.5+ star app store rating
 - **Training Efficiency:** 50% reduction in new technician training time
 - **Error Reduction:** 60% decrease in compliance violations
 - **Knowledge Retention:** 80% improvement in technician competency scores
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7. Implementation Timeline

7.1 Phase 1: MVP (Months 1-4)

- Core AI assistant with basic Q&A
- Mobile app with essential features
- Basic document repository
- User authentication system

7.2 Phase 2: Enhanced Features (Months 5-8)

- Computer vision for parts identification
- Advanced troubleshooting workflows
- Job management integration
- Performance analytics dashboard

7.3 Phase 3: Advanced Capabilities (Months 9-12)

- Predictive maintenance features
- AR/VR integration preparation
- Advanced learning algorithms
- Full compliance automation

7.4 Phase 4: Market Expansion (Months 13+)

- Multi-industry adaptation
 - Advanced integrations
 - AI glasses support
 - International expansion
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8. Risk Assessment

8.1 Technical Risks

- **AI Accuracy:** Mitigation through extensive training data and human oversight
- **Scalability:** Cloud-native architecture with auto-scaling capabilities
- **Integration Complexity:** Phased approach with fallback options

8.2 Business Risks

- **Market Adoption:** Pilot program with key customers before full launch
 - **Competition:** Rapid development and patent protection strategies
 - **Regulatory Changes:** Automated monitoring and update systems
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9. Conclusion

AI BrainFrame represents a transformative opportunity in the field service industry. By combining cutting-edge AI technology with deep industry knowledge, we can create a competitive advantage that revolutionizes how fire alarm and access control services are delivered.

The comprehensive feature set, professional architecture, and clear success metrics position this project for significant market impact and business growth.

Document Prepared By: Technical Team

Review Required By: Executive Leadership, Technical Architecture Board

Next Steps: Technical Requirements Document (TRD) and System Architecture Design