Unified Timesheet & Contract Management System

Technical Specification Document

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1. Executive Summary

This document outlines the technical architecture and functional requirements for a Unified Application that integrates timesheet management and contract documentation workflows. The system serves three distinct user categories: Employees, Admins, and Contract Management Group (CMG), each with specific roles and access permissions.

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2. System Overview

2.1 Purpose

The system aims to streamline timesheet submission, approval workflows, and contract document management while maintaining role-based access control and audit trails.

2.2 Key Objectives

- Unified authentication system using company credentials
- Automated timesheet approval workflows
- Flexible configuration for timesheet recipients
- Centralized contract document management
- Automated renewal notifications
- Role-based access control with data segregation

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3. User Roles & Permissions

3.1 Employee Role

Access Level: Basic User

Capabilities:

- Login using official company account (SSO/OAuth2 integration)
- Submit monthly/weekly timesheets based on assigned format
- View timesheet submission history
- Track timesheet approval status
- Receive notifications on timesheet approval/rejection
- View assigned projects and basic profile information

Restrictions:

- Cannot view bill rates or payroll information
- Cannot access admin or CMG functions
- Cannot view other employees' timesheets

3.2 Admin Role

Access Level: Administrative (Multiple sub-roles)

Sub-categories:

- Accounts Team Admin
- Time Management Team Admin
- Leadership Admin

Capabilities:

- Add/edit/deactivate employee records
- Configure employee details: contact information, project assignments, timesheet format
- Set and manage pay rates (visible only to admins)
- Configure bill rates per employee/project
- Manage approval workflows and reporting managers
- Configure timesheet recipients (flexible assignment to multiple teams)
- View and export timesheet data
- Generate reports on timesheet submissions and approvals
- Manage user access and permissions
- Configure system settings and notification preferences

Restrictions:

- Cannot access CMG document management functions
- Bill rates are segregated and not visible to employees or CMG users

3.3 Contract Management Group (CMG) Role

Access Level: Document Management

Capabilities:

- Upload and manage contract documents (MSA, PO, SOW, NDAs, disclosures)
- Associate documents with specific employees and projects
- Set document expiration dates and renewal periods
- Receive automated notifications for document renewals
- Track document versions and revision history
- Generate reports on contract status and upcoming renewals
- Search and filter documents by employee, project, document type, or expiration date
- Configure notification preferences for renewals
- Export contract data for compliance reporting

Restrictions:

- Cannot access timesheet data or employee pay/bill rates
- Cannot modify employee records or admin settings
- Read-only access to employee-project assignments

4. System Architecture

4.1 Technology Stack Recommendation

Frontend:

- React.js or Angular for responsive web application
- React Native or Flutter for mobile applications (iOS/Android)
- Material-UI or Ant Design for consistent UI components

Backend:

- Node.js with Express.js or Python with Django/FastAPI
- RESTful API architecture
- JWT tokens for session management

Database:

- PostgreSQL for relational data (users, timesheets, approvals)
- MongoDB or AWS S3 for document storage
- Redis for caching and session management

Authentication:

- OAuth 2.0 / SAML 2.0 for SSO integration
- Microsoft Azure AD or Okta for identity management
- Role-Based Access Control (RBAC) implementation

Infrastructure:

- Cloud hosting: AWS, Azure, or Google Cloud Platform
- Docker containers for microservices
- Kubernetes for orchestration
- CI/CD pipeline using Jenkins or GitHub Actions

Additional Services:

- SendGrid or AWS SES for email notifications
- Twilio for SMS notifications (optional)
- CloudWatch or ELK stack for logging and monitoring

4.2 System Components

4.2.1 Authentication Module

- SSO integration with company identity provider
- Multi-factor authentication support
- Session management and token refresh
- Password reset and account recovery

4.2.2 Employee Module

- Timesheet creation interface (weekly/monthly views)
- Project selection and time entry
- Timesheet submission and status tracking

- Notification center for approvals and rejections
- Personal profile management

4.2.3 Admin Module

- Employee management dashboard
- Project and assignment configuration
- Pay rate and bill rate management (encrypted storage)
- Approval workflow configuration
- Timesheet recipient configuration
- Reporting and analytics dashboard
- System settings and configuration

4.2.4 CMG Module

- Document upload interface with drag-and-drop
- Document categorization system
- Employee-document association interface
- Renewal tracking dashboard
- Notification management system
- Document search and filtering
- Version control and audit trail

4.2.5 Workflow Engine

- Configurable approval chains
- Automated routing based on reporting manager
- Escalation policies for pending approvals
- Parallel approval support (if required)
- Approval delegation functionality

4.2.6 Notification System

- Email notifications for all key events
- In-app notification center
- Configurable notification preferences per user
- Digest notifications (daily/weekly summaries)

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5. Key Features & Functionality

5.1 Timesheet Management

5.1.1 Timesheet Creation

- Dynamic form based on assigned format (weekly/monthly)
- Project-based time entry with task descriptions
- Support for multiple projects per timesheet
- Draft save functionality
- Time validation rules (max hours per day/week)
- Comments and notes section

5.1.2 Approval Workflow

Step 1: Employee submits timesheet
Step 2: Auto-routed to reporting manager
Step 3: Manager reviews and approves/rejects
Step 4: Upon approval, timesheet distributed to configured recipients
Step 5: All parties notified of final status

Features:

- Bulk approval for managers
- Rejection with mandatory comments
- Edit and resubmit functionality
- Approval deadline reminders
- Escalation for overdue approvals

5.1.3 Timesheet Distribution

- Configurable recipient lists per employee (managed by admins)
- Automatic distribution to: Time Management Team, Accounts Team, Leadership
- Email delivery with PDF attachment
- Secure portal access for recipients
- Read receipts and tracking

5.2 Contract Document Management

5.2.1 Document Upload & Organization

- Support for multiple file formats (PDF, Word, Excel, images)
- Document categorization: MSA, PO, SOW, NDA, Disclosures, Other
- Metadata capture: document name, type, employee, project, start date, end date, renewal period
- Bulk upload capability
- Document templates for common contract types

5.2.2 Document Association

- Link documents to one or multiple employees
- Associate with specific projects
- Tag system for additional categorization
- Search by employee name, project, or document attributes

5.2.3 Renewal Tracking & Notifications

Automatic Notifications:

- 90 days before expiration (first reminder)
- 60 days before expiration
- 30 days before expiration
- 15 days before expiration
- 7 days before expiration (urgent)
- Day of expiration and daily thereafter until renewed

Notification Content:

- Document type and name
- Associated employee and project
- Current expiration date
- Days remaining
- Action items and contact information

Configurable Settings:

- Custom notification schedules
- Notification recipients (primary and CC)
- Escalation rules for overdue renewals

5.2.4 Document Version Control

- Upload new versions while maintaining history
- Compare versions side-by-side
- Track who uploaded and when
- Rollback capability to previous versions

5.2.5 Compliance & Reporting

- Dashboard showing all upcoming renewals
- Expired documents report
- Documents by employee report
- Documents by project report
- Audit trail of all document activities
- Export capabilities (Excel, CSV, PDF)

5.3 Admin Configuration

5.3.1 Employee Management

- Create new employee records
- Edit existing employee information
- Deactivate employees (soft delete with data retention)
- Import employees from CSV/Excel
- Export employee data

Employee Information Fields:

- Personal details: Name, employee ID, email, phone
- Employment details: Department, designation, join date
- Project assignments: Current and historical projects
- Timesheet settings: Format (weekly/monthly), reporting manager
- Compensation: Pay rate (admin-only visibility)
- Bill rate: Per project or default rate (admin-only visibility)

5.3.2 Project Management

- Create and manage projects
- Assign employees to projects
- Set project-specific bill rates
- Define project duration and milestones
- Archive completed projects

5.3.3 Workflow Configuration

- Define approval hierarchies
- Set up reporting manager relationships
- Configure timesheet recipient groups
- Create custom approval rules

5.3.4 Rate Management

Pay Rate Configuration:

- Set default pay rates per employee
- Override rates for specific projects
- Support for hourly, daily, or monthly rates
- Effective date ranges for rate changes
- Audit trail of rate modifications

Bill Rate Configuration:

- Set default bill rates per employee
- Project-specific bill rate overrides
- Client-based billing configurations
- Rate card management

Security:

- Pay and bill rates encrypted at rest
- Access logs for rate viewing/modification
- Visible only to authorized admin users
- Excluded from all employee and CMG exports

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6. Data Security & Privacy

6.1 Authentication & Authorization

- SSL/TLS encryption for all data in transit
- Encrypted storage for sensitive data (rates, documents)
- Role-based access control with principle of least privilege
- Session timeout and automatic logout
- IP whitelisting for admin access (optional)

6.2 Data Segregation

- Logical separation of employee, admin, and CMG data
- Database-level access controls
- API-level permission checks
- Audit logging for all data access

6.3 Document Security

- Secure document storage with access controls
- Virus scanning on upload
- Watermarking for sensitive documents (optional)

- Download tracking and restrictions
- Document retention policies

6.4 Compliance

- GDPR compliance for personal data handling
- SOC 2 Type II compliance considerations
- Regular security audits and penetration testing
- Data backup and disaster recovery procedures
- Audit trails for all critical operations

7. User Interface Design Principles

7.1 General Principles

- Responsive design for desktop, tablet, and mobile
- Intuitive navigation with role-specific dashboards
- Consistent design language across modules
- Accessibility compliance (WCAG 2.1 Level AA)
- Performance optimization for fast load times

7.2 Employee Dashboard

- Quick timesheet submission access
- Pending submissions reminder
- Approval status at a glance
- Recent activity feed
- Help resources and FAQs

7.3 Admin Dashboard

- Key metrics: Pending approvals, submission rates, active employees
- Quick access to employee management
- System health indicators
- Recent admin activities
- Reporting shortcuts

7.4 CMG Dashboard

- Upcoming renewals prominently displayed
- Document upload shortcut
- Search and filter interface
- Notification center
- Quick stats: Total documents, expiring soon, expired

8. Reporting & Analytics

8.1 Employee Reports

- Timesheet submission history

- Project time breakdown
- Personal timesheet statistics

8.2 Admin Reports

- Timesheet submission compliance rates
- Approval turnaround times
- Time spent by project/employee
- Labor cost analysis (using pay rates)
- Revenue analysis (using bill rates)
- Employee utilization rates
- Custom report builder

8.3 CMG Reports

- Documents expiring in next 30/60/90 days
- Expired documents requiring action
- Documents by employee/project
- Renewal completion rates
- Compliance status reports
- Document upload activity

8.4 Export Capabilities

- PDF, Excel, CSV formats
- Scheduled report delivery via email
- Custom date ranges and filters
- Data visualization with charts and graphs

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9. Notification System

9.1 Email Notifications

Employee Notifications:

- Timesheet approval/rejection
- Upcoming timesheet submission deadline
- Profile updates by admin

Admin Notifications:

- New timesheet submissions pending approval
- Overdue approvals escalation
- System alerts and errors
- New employee added/modified

CMG Notifications:

- Document renewal reminders (tiered approach)
- New document uploaded confirmation
- Document access requests
- System maintenance alerts

9.2 In-App Notifications

- Real-time notification center
- Badge counts for unread notifications
- Notification preferences per user
- Notification history and archive

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10. Integration Capabilities

10.1 Required Integrations

- Company SSO/Identity Provider (Azure AD, Okta, etc.)
- Email service (SMTP, SendGrid, AWS SES)
- Document storage (AWS S3, Azure Blob Storage)

10.2 Optional Integrations

- Payroll systems (ADP, SAP, etc.)
- Project management tools (Jira, Asana)
- CRM systems (Salesforce)
- Accounting software (QuickBooks, Xero)
- Calendar systems (Google Calendar, Outlook)
- Slack/Teams for notifications

10.3 API Design

- RESTful API architecture
- Comprehensive API documentation (Swagger/OpenAPI)
- Webhook support for external system notifications
- Rate limiting and throttling
- API versioning strategy

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11. Development Approach

11.1 Methodology

- Agile/Scrum development process
- Two-week sprint cycles
- Daily stand-ups and sprint retrospectives
- Continuous integration and deployment

11.2 Development Phases

Phase 1: Foundation (Weeks 1-4)

- Architecture setup and infrastructure provisioning
- Database schema design and implementation
- Authentication and authorization framework
- Basic UI framework and design system

Phase 2: Employee Module (Weeks 5-8)

- Timesheet creation interface
- Submission workflow
- Employee dashboard
- Basic notification system

Phase 3: Admin Module (Weeks 9-12)

- Employee management interface
- Project and assignment management
- Rate configuration (pay and bill)
- Approval workflow configuration
- Timesheet recipient configuration

Phase 4: Approval Workflow (Weeks 13-15)

- Workflow engine implementation
- Manager approval interface
- Automated routing logic
- Escalation policies

Phase 5: CMG Module (Weeks 16-19)

- Document upload and storage
- Document association interface
- Renewal tracking system
- Notification engine for renewals

Phase 6: Reporting & Analytics (Weeks 20-22)

- Report builder implementation
- Dashboard visualizations
- Export functionality
- Custom report templates

Phase 7: Testing & Refinement (Weeks 23-26)

- Unit testing and integration testing
- User acceptance testing (UAT)
- Performance testing and optimization
- Security audit and penetration testing
- Bug fixes and refinements

Phase 8: Deployment & Training (Weeks 27-28)

- Production deployment
- Data migration from legacy systems
- User training sessions (role-specific)
- Documentation and help resources
- Go-live support

11.3 Quality Assurance

- Test-driven development (TDD) approach
- Automated testing suite (unit, integration, end-to-end)
- Code review process

- Security scanning and vulnerability assessment
- Performance benchmarking
- User acceptance testing with actual users from each role

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12. Deployment Strategy

12.1 Environment Setup

- Development environment for active development
- Staging environment for UAT and pre-production testing
- Production environment with high availability
- Disaster recovery environment

12.2 Deployment Process

- Blue-green deployment for zero downtime
- Automated deployment pipeline
- Database migration strategy
- Rollback procedures
- Post-deployment validation

12.3 Monitoring & Maintenance

- Application performance monitoring (APM)
- Error tracking and alerting
- Log aggregation and analysis
- Regular security patches and updates
- Monthly maintenance windows

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13. Training & Documentation

13.1 User Documentation

- Role-specific user guides (Employee, Admin, CMG)
- Video tutorials for common tasks
- FAQ section and knowledge base
- In-app contextual help
- Quick reference cards

13.2 Technical Documentation

- System architecture documentation
- API documentation with examples
- Database schema documentation
- Deployment and operations guide
- Troubleshooting guide

13.3 Training Plan

- Role-based training sessions

- Hands-on workshops
- Train-the-trainer program for super users
- Ongoing support during initial rollout

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14. Success Metrics

14.1 Key Performance Indicators (KPIs)

- Timesheet submission rate (target: 95% on-time)
- Average approval turnaround time (target: <48 hours)
- Document renewal compliance (target: 100% renewed before expiration)
- User adoption rate (target: 90% within first month)
- System uptime (target: 99.9%)
- User satisfaction score (target: 4.5/5)

14.2 Business Impact

- Reduction in manual timesheet processing time
- Improved contract compliance and renewal rates
- Enhanced visibility into labor costs and billing
- Reduced administrative overhead
- Better audit trail and compliance reporting

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15. Risk Management

15.1 Identified Risks

- Data security breach
- System downtime during critical periods
- User adoption resistance
- Integration challenges with existing systems
- Performance issues with large document volumes

15.2 Mitigation Strategies

- Comprehensive security measures and regular audits
- High availability architecture with failover
- Change management and training programs
- Early integration testing and sandbox environments
- Performance testing and optimization
- Regular backups and disaster recovery procedures

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16. Future Enhancements (Post-MVP)

16.1 Phase 2 Features

- Mobile application (native iOS and Android)
- Advanced analytics with machine learning insights
- Chatbot for common queries and support

- Approval via email (approve/reject without login)
- Biometric authentication for mobile

16.2 Phase 3 Features

- Multi-currency support for international operations
- Advanced workflow automation with conditional logic
- Integration with time tracking tools
- E-signature integration for contract approvals
- Advanced document OCR for automatic data extraction
- Predictive analytics for resource planning

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17. Appendices

Appendix A: Glossary

- **MSA:** Master Service Agreement
- **PO:** Purchase Order
- **SOW:** Statement of Work
- **NDA:** Non-Disclosure Agreement
- **SSO:** Single Sign-On
- **RBAC:** Role-Based Access Control
- **CMG:** Contract Management Group

Appendix B: Sample Workflows

Detailed flowcharts for:

- Timesheet submission and approval
- Document upload and renewal notification
- Employee onboarding in the system

Appendix C: Database Schema Overview

High-level entity relationship diagram showing key tables and relationships.

Appendix D: API Endpoint Reference

Summary of key API endpoints for integration purposes.

Document Approval

This technical specification document should be reviewed and approved by:

- Technical Team Lead
- Product Manager
- Security Officer
- Compliance Manager
- Key Stakeholders from Admin, HR, and Finance teams

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End of Document