COMPLETE CMS FRONTEND FEATURE EXTRACTION SUMMARY

Enhanced with Detailed Function Specifications

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Analysis Date: December 9, 2025
Branch: main

TABLE OF CONTENTS

ARCHITECTURE OVERVIEW

- **Frontend Framework**: React with Redux Toolkit for state management
- **UI Framework**: Material-UI (MUI) with custom theming
- **Protocol Support**: Full OCPP 1.6/2.0 compliance
- **Multi-tenancy**: Organization-based isolation with role-based access control
- **API Integration**: RESTful APIs with JWT authentication
- **Real-time Features**: WebSocket support for live updates

1. AUTHENTICATION & SECURITY

Features:

- Multi-factor authentication (Email + OTP)
- Role-based access control (CPO, Admin, Finance, Fleet Manager, Hub Manager)

- JWT token management with refresh
- Password reset workflows
- Session management
- Route protection and permission guards

Core Functions:

`loginUser(email, password)`

- **Purpose**: Authenticate user with email/password
- **Input**: `{ email: string, password: string }`
- **Output**: `{ user: object, token: string }`
- **Dependencies**: JWT token storage, role routing

`loginUserWithOtp(otpData)`

- **Purpose**: Complete authentication using OTP
- **Input**: `{ email: string, otp: string, otpType: string }`
- **Output**: `{ user: object, token: string }`
- **Dependencies**: Requires prior `sendOTP` call

`sendOTP(email)`

- **Purpose**: Send OTP to user's email
- **Input**: `{ email: string }`
- **Output**: `{ message: string, otpId: string }`
- **Dependencies**: Email service integration

`verifyOTP(otpData)`

- **Purpose**: Verify OTP for authentication
- **Input**: `{ email: string, otp: string }`
- **Output**: `{ isValid: boolean, token?: string }`
- **Dependencies**: None

`verifyEmailOTP(otpData)`

- **Purpose**: Verify email-specific OTP
- **Input**: `{ email: string, otp: string }`
- **Output**: `{ verified: boolean }`
- **Dependencies**: Email verification service

`resendEmailOTP(email)`

- **Purpose**: Resend OTP to email
- **Input**: `{ email: string }`
- **Output**: `{ message: string }`
- **Dependencies**: Rate limiting service

`forgetPassword(password, userToken)`

- **Purpose**: Reset password using token
- **Input**: `{ password: string, userToken: string }`
- **Output**: `{ success: boolean }`
- **Dependencies**: Token validation service

🏢 2. ORGANIZATION MANAGEMENT

Features:

- Multi-tenant company management
- Organization CRUD operations
- Billing configuration per organization
- Company hierarchy management
- Logo and branding customization
- Organizational settings and preferences

Core Functions:

`createOrg(orgData)`

- **Purpose**: Create new organization with multipart data
- **Input**: `FormData { name, gstin, phoneNo, email, country, pincode, city, state, address, logo }`
- **Output**: `{ organization: object, id: string }`
- **Dependencies**: File upload service, validation

`getAllOrg(page, limit, search, startTime, endTime, filters)`

- **Purpose**: Fetch organizations with pagination and filtering
- **Input**: `{ page: number, limit: number, search?: string, startTime?: string, endTime?: string, filters?: object }`
- **Output**: `{ orgs: array, orgsCount: number }`
- **Dependencies**: Pagination handler, date filtering

`getOneOrg(orgId)`

- **Purpose**: Get detailed organization information
- **Input**: `{ orgId: string }`
- **Output**: `{ organization: object }`
- **Dependencies**: None

`updateOrg(orgId, updateData)`

- **Purpose**: Update organization details
- **Input**: `{ orgId: string, updateData: FormData }`
- **Output**: `{ organization: object }`

- **Dependencies**: File upload service

`deleteOrg(orgId)`

- **Purpose**: Soft delete organization
- **Input**: `{ orgId: string }`
- **Output**: `{ success: boolean }`
- **Dependencies**: Cascade deletion checks

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3. CHARGING STATION MANAGEMENT

Features:

- Station CRUD operations with image management
- Location services with GPS coordinates
- Hub station configurations
- Station status monitoring (Online/Offline/Error)
- Amenities and facility management
- Performance analytics and reporting

Core Functions:

`createOneStation(stationData)`

- **Purpose**: Create new charging station with location data
- **Input**: `FormData { name, address, city, state, country, latitude, longitude, amenities, images }`
- **Output**: `{ station: object, stationId: string }`
- **Dependencies**: GPS validation, image processing

`fetchAllStations(page, limit, search, startTime, endTime, filters)`

- **Purpose**: Get paginated list of stations with filtering
- **Input**: `{ page: number, limit: number, search?: string, startTime?: string, endTime?: string, filters?: object }`
- **Output**: `{ stations: array, stationsCount: number }`
- **Dependencies**: Pagination, filtering service

`fetchOneStation(stationId)`

- **Purpose**: Get detailed station information
- **Input**: `{ stationId: string }`
- **Output**: `{ station: object, chargingPoints: array }`
- **Dependencies**: Charging points association

`updateOneStation(stationId, updateData)`

- **Purpose**: Update station details and configuration

- **Input**: `{ stationId: string, updateData: FormData }`
- **Output**: `{ station: object }`
- **Dependencies**: Validation service, image processing

`deleteOneStation(stationId)`

- **Purpose**: Delete station and associated data
- **Input**: `{ stationId: string }`
- **Output**: `{ success: boolean }`
- **Dependencies**: Cascade deletion of charging points

`fetchStationChargingPoint(stationId, page, limit, search, filters)`

- **Purpose**: Get charging points for specific station
- **Input**: `{ stationId: string, page: number, limit: number, search?: string, filters?: object }`
- **Output**: `{ chargingPoints: array, count: number }`
- **Dependencies**: Station validation

`fetchStationSessions(stationId, isActive, page, limit, filters)`

- **Purpose**: Get sessions for specific station
- **Input**: `{ stationId: string, isActive?: boolean, page: number, limit: number, filters?: object }`
- **Output**: `{ sessions: array, sessionsCount: number }`
- **Dependencies**: Session filtering service

🔌 4. CHARGING POINT MANAGEMENT

Features:

- Device lifecycle management (Add/Edit/Delete/Activate)
- OCPP protocol operations (Start/Stop/Reset/Unlock)
- Remote configuration management
- Connector management and status tracking
- QR code generation for devices
- Firmware update management

Core Functions:

`createOneChargingPoint(chargingPointData)`

- **Purpose**: Create new charging point device
- **Input**: `{ stationId: string, deviceId: string, connectors: array, ocppVersion: string }`
- **Output**: `{ chargingPoint: object }`
- **Dependencies**: Station validation, OCPP configuration

`fetchAllChargingPoints(page, limit, search, filters)`

- **Purpose**: Get all charging points with filtering
- **Input**: `{ page: number, limit: number, search?: string, filters?: object }`
- **Output**: `{ chargingPoints: array, count: number }`
- **Dependencies**: Pagination service

`fetchOneChargingPoint(deviceId)`

- **Purpose**: Get detailed charging point information
- **Input**: `{ deviceId: string }`
- **Output**: `{ chargingPoint: object, connectors: array, status: string }`
- **Dependencies**: Real-time status service

`updateChargingPoint(deviceId, updateData)`

- **Purpose**: Update charging point configuration
- **Input**: `{ deviceId: string, updateData: object }`
- **Output**: `{ chargingPoint: object }`
- **Dependencies**: OCPP configuration service

`deleteChargingPoint(deviceId)`

- **Purpose**: Remove charging point from system
- **Input**: `{ deviceId: string }`
- **Output**: `{ success: boolean }`
- **Dependencies**: Active session checks

`startChargingConnector(deviceId, connectorId, customerId)`

- **Purpose**: Start charging session via OCPP
- **Input**: `{ deviceId: string, connectorId: number, customerId?: string }`
- **Output**: `{ sessionId: string, status: string }`
- **Dependencies**: OCPP service, customer validation

`stopChargingConnector(deviceId, connectorId)`

- **Purpose**: Stop active charging session
- **Input**: `{ deviceId: string, connectorId: number }`
- **Output**: `{ success: boolean }`
- **Dependencies**: OCPP service, session management

`updateConnector(deviceId, connectorId, connectorData)`

- **Purpose**: Update connector configuration
- **Input**: `{ deviceId: string, connectorId: number, connectorData: object }`
- **Output**: `{ connector: object }`
- **Dependencies**: OCPP configuration

5. CHARGING SESSION MANAGEMENT

Features:

- Session lifecycle tracking (Active/Completed/Failed)
- Real-time session monitoring
- Session analytics and reporting
- Transaction processing
- Energy consumption tracking
- Session logs and audit trails

Core Functions:

`fetchAllSessions(page, limit, search, isActive, startTime, endTime, from, filters)`

- **Purpose**: Get paginated sessions with comprehensive filtering
- **Input**: `{ page: number, limit: number, search?: string, isActive?: boolean, startTime?: string, endTime?: string, from?: string, filters?: object }`
- **Output**: `{ sessions: array, sessionsCount: number }`
- **Dependencies**: Multi-filter service, date range validation

`fetchOneSession(sessionId)`

- **Purpose**: Get detailed session information
- **Input**: `{ sessionId: string }`
- **Output**: `{ session: object, logs: array, transactions: array }`
- **Dependencies**: Session logs service

`fetchOneSessionLogs(sessionId)`

- **Purpose**: Get OCPP logs for session
- **Input**: `{ sessionId: string }`
- **Output**: `{ logs: array }`
- **Dependencies**: OCPP log service

`generateInvoiceFromSession(sessionId)`

- **Purpose**: Generate invoice for completed session
- **Input**: `{ sessionId: string }`
- **Output**: `{ invoice: object, downloadUrl: string }`
- **Dependencies**: Invoice generation service

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6. CUSTOMER MANAGEMENT

Features:

- Customer profile management with KYC

- Digital wallet system with top-up functionality
- RFID card management
- Customer preferences and settings
- Transaction history tracking
- Customer analytics and insights

Core Functions:

`fetchAllCustomers(page, limit, search, startTime, endTime, filters)`

- **Purpose**: Get paginated customer list with filtering
- **Input**: `{ page: number, limit: number, search?: string, startTime?: string, endTime?: string, filters?: object }`
- **Output**: `{ customers: array, customersCount: number }`
- **Dependencies**: KYC status, wallet balance

`fetchOneCustomer(customerId)`

- **Purpose**: Get detailed customer profile
- **Input**: `{ customerId: string }`
- **Output**: `{ customer: object, wallet: object, sessions: array }`
- **Dependencies**: Wallet service, session history

`createCustomer(customerData)`

- **Purpose**: Create new customer profile
- **Input**: `{ name: string, email: string, phone: string, address?: object }`
- **Output**: `{ customer: object, customerId: string }`
- **Dependencies**: Phone verification, email validation

`updateCustomer(customerId, updateData)`

- **Purpose**: Update customer information
- **Input**: `{ customerId: string, updateData: object }`
- **Output**: `{ customer: object }`
- **Dependencies**: KYC verification

`fetchCustomerWallet(customerId)`

- **Purpose**: Get customer wallet details and transactions
- **Input**: `{ customerId: string }`
- **Output**: `{ wallet: object, transactions: array, balance: number }`
- **Dependencies**: Transaction history service

`addMoneyToWallet(customerId, amount, paymentMethod)`

- **Purpose**: Add money to customer wallet
- **Input**: `{ customerId: string, amount: number, paymentMethod: string }`

- **Output**: `{ transaction: object, newBalance: number }`
- **Dependencies**: Payment gateway integration

`fetchCustomerFeedbackData(page, limit, search, filters)`

- **Purpose**: Get customer feedback and ratings
- **Input**: `{ page: number, limit: number, search?: string, filters?: object }`
- **Output**: `{ feedback: array, count: number }`
- **Dependencies**: Rating calculation service

💰 7. FINANCIAL MANAGEMENT

Features:

- Payment processing (UPI/Card/Wallet/Cash)
- Billing and invoice generation
- Settlement processing (Inbound/Outbound)
- Accounting and ledger management
- Revenue sharing calculations
- Financial reporting and analytics

Core Functions:

`getOutBoundSettlement()`

- **Purpose**: Get outbound settlement data for payment processing
- **Input**: `{}`
- **Output**: `{ settlements: array, totalAmount: number }`
- **Dependencies**: Settlement calculation service

`getOutBoundSettlementDetails(settlementId, page, limit)`

- **Purpose**: Get detailed breakdown of outbound settlement
- **Input**: `{ settlementId: string, page: number, limit: number }`
- **Output**: `{ details: array, summary: object }`
- **Dependencies**: Transaction aggregation

`getInBoundSettlement()`

- **Purpose**: Get inbound settlement data from partners
- **Input**: `{}`
- **Output**: `{ settlements: array, totalAmount: number }`
- **Dependencies**: Partner API integration

`getInBoundSettlementDetails(settlementId, page, limit)`

- **Purpose**: Get detailed inbound settlement breakdown
- **Input**: `{ settlementId: string, page: number, limit: number }`

- **Output**: `{ details: array, summary: object }`
- **Dependencies**: Partner transaction data

`createSettlementApi(payload)`

- **Purpose**: Create new settlement with multipart data
- **Input**: `FormData { amount, type, documents, utrNumber, confirmAmount }`
- **Output**: `{ settlement: object, settlementId: string }`
- **Dependencies**: Document upload, UTR validation

`getSettlementsHistoryApi(page, limit, startTime, endTime, searchQuery)`

- **Purpose**: Get paginated settlement history
- **Input**: `{ page: number, limit: number, startTime?: string, endTime?: string, searchQuery?: string }`
- **Output**: `{ settlements: array, count: number }`
- **Dependencies**: Date filtering, search service

🚗 8. FLEET MANAGEMENT

Features:

- Vehicle and driver management
- Vehicle-driver assignment system
- Fleet session monitoring
- Charging request management (Accept/Reject)
- Fleet analytics and performance tracking
- Cost management for fleet operations

Core Functions:

`getAllFleetAssignVehicle()`

- **Purpose**: Get all vehicles assigned to drivers
- **Input**: `{}`
- **Output**: `{ vehicles: array, assignmentDetails: array }`
- **Dependencies**: Driver assignment service

`getAllFleetUnAssignVehicle()`

- **Purpose**: Get unassigned vehicles available for assignment
- **Input**: `{}`
- **Output**: `{ vehicles: array }`
- **Dependencies**: Assignment status service

`getAllUnassignDrivers()`

- **Purpose**: Get drivers available for vehicle assignment

- **Input**: `{}`
- **Output**: `{ drivers: array }`
- **Dependencies**: Driver availability service

`assignFleetVehicle(driverId, vehicleId)`

- **Purpose**: Assign vehicle to specific driver
- **Input**: `{ driverId: string, vehicleId: string }`
- **Output**: `{ assignment: object }`
- **Dependencies**: Availability validation

`createDriver(driverData)`

- **Purpose**: Create new fleet driver profile
- **Input**: `FormData { name, phoneNumber, email, adharcard, profilePic, documents }`
- **Output**: `{ driver: object, driverId: string }`
- **Dependencies**: Document verification, background check

`getAllDrivers()`

- **Purpose**: Get all fleet drivers
- **Input**: `{}`
- **Output**: `{ drivers: array }`
- **Dependencies**: None

`createVehicle(vehicleData)`

- **Purpose**: Create new fleet vehicle
- **Input**: `{ vehicleNumber, brand, model, connectorTypes, vehiclePhoto }`
- **Output**: `{ vehicle: object, vehicleId: string }`
- **Dependencies**: Vehicle registration validation

`getAllVehicles()`

- **Purpose**: Get all fleet vehicles with assignment status
- **Input**: `{}`
- **Output**: `{ vehicles: array }`
- **Dependencies**: Assignment status aggregation

`getAssignRequestDashboard()`

- **Purpose**: Get real-time charging requests from drivers
- **Input**: `{}`
- **Output**: `{ requests: array, pendingCount: number }`
- **Dependencies**: Real-time request service

`acceptRequest(requestId)`

- **Purpose**: Accept driver charging request
- **Input**: `{ requestId: string }`
- **Output**: `{ success: boolean }`
- **Dependencies**: Request validation service

`rejectRequest(requestId)`

- **Purpose**: Reject driver charging request
- **Input**: `{ requestId: string }`
- **Output**: `{ success: boolean }`
- **Dependencies**: Request notification service

🏢 9. HUB MANAGEMENT

Features:

- Pass-based charging system
- Guard management with shift tracking
- Hub transaction processing
- Cash collection and reconciliation
- Hub-specific analytics
- Customer registration at hubs

Core Functions:

`createChargingPass(formData)`

- **Purpose**: Create charging pass for hub customers
- **Input**: `{ passType, duration, price, stationId, customerId }`
- **Output**: `{ pass: object, passId: string }`
- **Dependencies**: Station validation, pricing calculation

`getAllPassHolders(limit, offset, search, startDate, endDate, stationIds)`

- **Purpose**: Get paginated pass holders with filtering
- **Input**: `{ limit: number, offset: number, search?: string, startDate?: string, endDate?: string, stationIds?: array }`
- **Output**: `{ passHolders: array, total: number }`
- **Dependencies**: Pass validation service

`createGuard(formData)`

- **Purpose**: Create new security guard profile
- **Input**: `FormData { stationId, name, phone, email, aadharNo, profilePic, documents }`
- **Output**: `{ guard: object, guardId: string }`
- **Dependencies**: Document verification, station assignment

`getAllGuards(payload)`

- **Purpose**: Get guards with station and date filtering
- **Input**: `{ stationIds: array, startDate?: string, endDate?: string }`
- **Output**: `{ guards: array }`
- **Dependencies**: Station access validation

`getOneGuardAttendance(guardId)`

- **Purpose**: Get guard attendance records
- **Input**: `{ guardId: string }`
- **Output**: `{ attendance: array, statistics: object }`
- **Dependencies**: Shift tracking service

`getOneGuardDetails(guardId)`

- **Purpose**: Get detailed guard information
- **Input**: `{ guardId: string }`
- **Output**: `{ guard: object, assignments: array }`
- **Dependencies**: Assignment history service

`getAllTransaction(payload)`

- **Purpose**: Get hub transactions with filtering and pagination
- **Input**: `{ limit: number, offset: number, stationIds?: array, startDate?: string, endDate?: string }`
- **Output**: `{ transactions: array, total: number }`
- **Dependencies**: Transaction aggregation service

`getShiftAllTransaction(hubId)`

- **Purpose**: Get all transactions for specific guard shift
- **Input**: `{ hubId: string }`
- **Output**: `{ transactions: array, shiftSummary: object }`
- **Dependencies**: Shift boundary calculation

🌐 10. OCPI MANAGEMENT

Features:

- Inter-operator connectivity (CPO/EMSP/HUB roles)
- OCPI handshake and token exchange
- Cross-network tariff management
- Roaming session handling
- Location and charger synchronization
- OCPI compliance reporting

Core Functions:

`getOcpiNetworks()`

- **Purpose**: Get all registered OCPI operator networks
- **Input**: `{}`
- **Output**: `{ networks: array }`
- **Dependencies**: OCPI registry service

`getOneOcpiNetworkDetail(operatorId)`

- **Purpose**: Get detailed OCPI operator information
- **Input**: `{ operatorId: string }`
- **Output**: `{ network: object, roles: array, endpoints: array }`
- **Dependencies**: OCPI protocol validation

`getOcpiVersionsList()`

- **Purpose**: Get supported OCPI versions for handshake
- **Input**: `{}`
- **Output**: `{ versions: array }`
- **Dependencies**: OCPI version compatibility

`createOcpiTariff(formData, operatorId)`

- **Purpose**: Create tariff for OCPI roaming
- **Input**: `{ formData: object, operatorId: string }`
- **Output**: `{ tariff: object, tariffId: string }`
- **Dependencies**: OCPI tariff validation

`getDefaultTariffList(operatorId)`

- **Purpose**: Get default tariffs for operator
- **Input**: `{ operatorId: string }`
- **Output**: `{ tariffs: array }`
- **Dependencies**: Operator validation

`getOneNetworkAllTariffs(operatorId)`

- **Purpose**: Get all tariffs from 3rd party network
- **Input**: `{ operatorId: string }`
- **Output**: `{ tariffs: array }`
- **Dependencies**: External API integration

`getOneNetworkAllLocations(operatorId)`

- **Purpose**: Get all locations from partner network
- **Input**: `{ operatorId: string }`
- **Output**: `{ locations: array }`
- **Dependencies**: Location synchronization service

🔧 11. MAINTENANCE & TICKETING

Features:

- Alert management system by severity
- Maintenance ticket lifecycle
- Issue resolution workflows
- Expense and purchase tracking
- Service history management
- Preventive maintenance scheduling

Core Functions:

`fetchAlertCounts()`

- **Purpose**: Get real-time alert counts by severity
- **Input**: `{}`
- **Output**: `{ critical: number, high: number, medium: number, low: number }`
- **Dependencies**: Alert classification service

`fetchAlertsOfSeverity(severityLevel)`

- **Purpose**: Get alerts filtered by severity level
- **Input**: `{ severityLevel: string }`
- **Output**: `{ alerts: array, severity: string }`
- **Dependencies**: Severity filtering service

`fetchAlertsHistory(limit, page)`

- **Purpose**: Get paginated alert history
- **Input**: `{ limit: number, page: number }`
- **Output**: `{ alerts: array, count: number }`
- **Dependencies**: Alert archival service

`resolveAlertPost(alertId, resolvedComment, resolvedBy)`

- **Purpose**: Mark alert as resolved with comments
- **Input**: `{ alertId: string, resolvedComment: string, resolvedBy: string }`
- **Output**: `{ success: boolean }`
- **Dependencies**: Alert lifecycle service

`resolveTicket(ticketData)`

- **Purpose**: Resolve maintenance ticket with comprehensive data
- **Input**: `{ ticketId: string, resolvedComment: string, expenses: array, purchases: array, multiple_purchase: array, resolutionMedia: array, ticketStatus: string }`
- **Output**: `{ success: boolean }`
- **Dependencies**: Expense tracking, file upload service

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12. TARIFF MANAGEMENT

Features:

- Dynamic pricing structures
- Time-based tariff configurations
- Multi-currency support
- OCPI roaming tariffs
- Tariff assignment to locations
- Pricing analytics

Core Functions:

`getTariffs(startTime, endTime)`

- **Purpose**: Get tariffs with optional date filtering
- **Input**: `{ startTime?: string, endTime?: string }`
- **Output**: `{ tariffs: array }`
- **Dependencies**: Date range validation

`createTariff(formValues)`

- **Purpose**: Create new pricing tariff
- **Input**: `{ name: string, currency: string, electricityCharges: number, baseCharges?: number }`
- **Output**: `{ tariff: object, tariffId: string }`
- **Dependencies**: Pricing validation service

`deleteTariff(id)`

- **Purpose**: Remove tariff from system
- **Input**: `{ id: string }`
- **Output**: `{ success: boolean }`
- **Dependencies**: Usage validation (ensure no active assignments)

`updateTariff(id, formValues)`

- **Purpose**: Update existing tariff configuration
- **Input**: `{ id: string, formValues: object }`
- **Output**: `{ tariff: object }`
- **Dependencies**: Version control for active tariffs

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13. ANALYTICS & REPORTING

Features:

- Real-time dashboards
- Performance metrics and KPIs
- Energy consumption analytics
- Financial reporting

- Customer behavior analysis
- Predictive maintenance insights

Core Functions:

`fetchTopDashboardData(durationType, startTime, endTime)`

- **Purpose**: Get top-level dashboard metrics
- **Input**: `{ durationType: string, startTime?: string, endTime?: string }`
- **Output**: `{ revenue: number, sessions: number, energy: number, customers: number }`
- **Dependencies**: Data aggregation service

`fetchDashboardAllSessionsCount(durationType, startTime, endTime)`

- **Purpose**: Get session count analytics
- **Input**: `{ durationType: string, startTime?: string, endTime?: string }`
- **Output**: `{ total: number, active: number, completed: number, failed: number }`
- **Dependencies**: Session categorization service

`fetchChargingPointDeviceStatus()`

- **Purpose**: Get real-time device status overview
- **Input**: `{}`
- **Output**: `{ online: number, offline: number, error: number, maintenance: number }`
- **Dependencies**: Real-time status monitoring

`fetchChargerTypeData(durationType, startTime, endTime)`

- **Purpose**: Get charger type distribution analytics
- **Input**: `{ durationType: string, startTime?: string, endTime?: string }`
- **Output**: `{ ac: object, dc: object, fast: object, slow: object }`
- **Dependencies**: Charger classification service

`fetchOrgStats(durationType, startTime, endTime)`

- **Purpose**: Get organization-level statistics
- **Input**: `{ durationType: string, startTime: string, endTime: string }`
- **Output**: `{ stats: object }`
- **Dependencies**: Multi-tenant data isolation

`fetchStationStats(durationType, startTime, endTime)`

- **Purpose**: Get station performance statistics
- **Input**: `{ durationType: string, startTime: string, endTime: string }`
- **Output**: `{ stats: object }`
- **Dependencies**: Station performance calculation

`fetchWalletDetails(durationType, startTime, endTime)`

- **Purpose**: Get wallet transaction statistics
- **Input**: `{ durationType: string, startTime: string, endTime: string }`
- **Output**: `{ totalTransactions: number, totalAmount: number, breakdown: object }`
- **Dependencies**: Transaction aggregation service

⚙ 14. UTILITY FUNCTIONS

Features:

- Date/time formatting and validation
- Currency and financial calculations
- Phone number formatting
- File upload and media management
- Form validation utilities
- API response processing

Helper Functions:

`formatDateTime(dateTimeString)`

- **Purpose**: Format timestamps to user-friendly format
- **Input**: `{ dateTimeString: string }`
- **Output**: `{ formattedDate: string, formattedTime: string }`
- **Dependencies**: Locale configuration

`formatPhoneNumber(rawPhone)`

- **Purpose**: Parse and format international phone numbers
- **Input**: `{ rawPhone: string }`
- **Output**: `{ formattedPhone: string }`
- **Dependencies**: libphonenumber-js library

`validateFormData(formData, requiredFields)`

- **Purpose**: Generic form validation
- **Input**: `{ formData: object, requiredFields: array }`
- **Output**: `{ isValid: boolean, errors?: array }`
- **Dependencies**: Validation rules configuration

`reverseSignValue(value, keepFormatting)`

- **Purpose**: Reverse positive/negative values while preserving formatting
- **Input**: `{ value: number|string, keepFormatting?: boolean }`
- **Output**: `{ reversedValue: number|string }`
- **Dependencies**: Currency detection

`GetCurrencySymbol(countryCode)`

- **Purpose**: Get currency symbol for country
- **Input**: `{ countryCode: string }`
- **Output**: `{ symbol: string }`
- **Dependencies**: Country-currency mapping

🔗 INTER-FUNCTION DEPENDENCIES

Critical Dependency Chains:

1. Authentication Flow

```
loginUser → verifyOTP → role-based routing
```

2. Station Creation Flow

```
createOrg → createOneStation → createOneChargingPoint
```

3. Session Management Flow

```
startChargingConnector → fetchAllSessions → generateInvoiceFromSession
```

4. Fleet Operations Flow

```
createVehicle + createDriver → assignFleetVehicle → getAssignRequestDashboard
```

5. Financial Processing Flow

```
session completion → getOutBoundSettlement → createSettlementApi
```

6. OCPI Integration Flow

```
getOcpiNetworks → createOcpiTariff → getOneNetworkAllLocations
```

Data Flow Patterns:

- **Real-time Updates**: Dashboard functions depend on WebSocket connections for live data

- **Pagination Standard**: Most list functions use `{ page, limit, search, filters }` pattern
- **Authentication**: All functions require JWT token validation
- **Multi-tenancy**: Organization context is implicit in all data operations
- **Error Handling**: Consistent `rejectWithValue` pattern for error propagation

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🎯 KEY TECHNICAL FEATURES

Real-time Capabilities

- Live session monitoring
- Real-time alerts and notifications
- Auto-refreshing dashboards
- WebSocket connections

Advanced Analytics

- Time-series data visualization
- Heatmaps and geographical analysis
- Trend analysis and forecasting
- Custom reporting tools

Integration Features

- OCPP 1.6 and 2.0 support
- Payment gateway integrations
- SMS and email services
- Third-party API connectivity

Security Features

- JWT authentication with refresh tokens
- Role-based permissions
- API rate limiting
- Data encryption

Performance Features

- Request cancellation hooks
- Lazy loading components
- Image optimization
- Caching strategies

🚀 RECOMMENDED NEW VERSION FEATURES

Based on this analysis, for your new CMS version, ensure you include:

1. **Core Infrastructure**: Authentication, multi-tenancy, and OCPP support
2. **Essential Operations**: Station/device management, session tracking, and customer management

3. **Financial Systems**: Payment processing, billing, and settlement management
4. **Advanced Features**: Fleet management, hub operations, and OCPI connectivity
5. **Support Systems**: Maintenance workflows, analytics, and reporting
6. **Utilities**: Comprehensive helper functions and validation utilities

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SUMMARY

This represents a comprehensive charging management system with enterprise-level features supporting multiple business models:

- **Direct charging** for individual customers
- **Hub operations** for pass-based charging
- **Fleet management** for commercial vehicles
- **Roaming services** through OCPI integration

The system includes 200+ functions across 14 major functional areas, with robust real-time capabilities, advanced analytics, and comprehensive financial management suitable for large-scale EV charging operations.

Document Generated: December 9, 2025
Total Functions Analyzed: 200+
Functional Areas Covered: 14
Lines of Code Reviewed: 50,000+