**HospoHub**

Data Structure

HospoHub/

├── index.html # Main entry point

├── manifest.json # PWA manifest

├── service-worker.js # Service worker for offline functionality

├── README.md # Project documentation

├── .gitignore # Git ignore file

├── assets/ # Static assets

│ ├── images/ # Image files

│ ├── icons/ # App icons for PWA

│ └── styles/ # Global CSS files

├── data/ # JSON data files

│ ├── recipes.json # Recipe database

│ ├── ingredients.json # Ingredients database

│ ├── suppliers.json # Supplier information

│ ├── prices.json # Price database

│ ├── pantry.json # Pantry inventory

│ ├── shopping\_lists.json # Shopping lists

│ └── classes.json # Class information

├── js/ # JavaScript modules

│ ├── app.js # Main application entry point

│ ├── auth.js # Authentication handling

│ ├── dataManager.js # Data loading and persistence

│ ├── services/ # Service modules

│ │ ├── recipeParser.js # AI recipe parsing

│ │ ├── calculator.js # Student quantity calculator

│ │ ├── pantryManager.js # Pantry management

│ │ ├── priceCompare.js # Price comparison

│ │ └── fileManager.js # File upload and management

│ ├── components/ # UI components

│ │ ├── recipe.js # Recipe page components

│ │ ├── pantry.js # Pantry page components

│ │ ├── shopping.js # Shopping list components

│ │ └── common.js # Reusable components

│ └── utils/ # Utility functions

│ ├── conversion.js # Unit conversion utilities

│ ├── storage.js # Local storage helpers

│ └── dates.js # Date formatting helpers

└── pages/ # Individual page templates

├── recipes.html # Recipes listing page

├── recipe-detail.html # Recipe detail view

├── pantry.html # Pantry management page

├── shopping.html # Shopping list page

└── settings.html # Settings page

**HospoHub Application**

**1. Landing Page (index.html)**

**Primary Purpose:** Create an engaging first impression and clearly communicate the value proposition of HospoHub to potential users, particularly hospitality education professionals.

**Visual Design:**

* Vibrant, animated gradient background that slowly shifts between culinary-themed colors (reds, oranges, blues)
* Clean, modern interface with ample white space for readability
* Professional food photography and culinary classroom imagery
* Consistent branding elements with the HospoHub logo and colour scheme

**Header Section:**

* Prominently displayed HospoHub logo
* Navigation menu with smooth-scrolling links to page sections
* Clear call-to-action buttons: "Log In" and "Sign Up" in contrasting colours
* Mobile-responsive collapsible menu for smaller screens

**Hero Section:**

* Compelling headline: "Recipe Management for Hospitality Education"
* Concise subheading explaining the core value proposition
* Large, high-quality hero image showing the application dashboard
* Primary CTA button "Get Started Free" and secondary "Learn More" button
* Subtle animation that fades in elements sequentially as the page loads

**Features Section:**

* Grid layout of 6 feature cards with custom icons
* Each card includes:
  + Distinctive icon representing the feature
  + Clear feature heading
  + Concise description of functionality and benefits
  + Subtle hover effects that slightly enlarge the card
* Features highlighted include:
  + AI-Powered Recipe Management
  + Student Quantity Calculator
  + Pantry Management
  + Smart Shopping Lists
  + Dietary & Allergy Tracking
  + Cloud Integration

**Benefits Section:**

* Split-column design separating teacher benefits from school benefits
* Each benefit includes a checkmark icon and concise explanation
* Teacher benefits focus on time-saving, organisation, and classroom efficiency
* School benefits emphasize cost reduction, waste minimisation, and consistency
* Background with subtle pattern related to cooking or education

**Testimonials Section:**

* Carousel slider with testimonials from actual hospitality educators
* Each testimonial includes:
  + Professional headshot of the educator
  + Full name and position
  + Institution name
  + Compelling quote about their experience with HospoHub
  + Star rating (all strategically showing 4.5-5 stars)
* Navigation dots and arrows for manual scrolling
* Auto-scrolling with appropriate timing

**Call-to-Action Section:**

* Contrasting background colour to make it stand out
* Compelling heading asking users to act
* Brief paragraph addressing potential hesitations
* Large "Get Started Free" button with hover animation
* Secondary "Contact Us" link for those needing more information
* Optional limited time offer or guarantee statement

**Footer:**

* Four-column layout with organized information
* About column with brief company description
* Navigation links to key site sections
* Legal links (Privacy Policy, Terms of Service)
* Contact information with email and support hours
* Social media links with recognizable icons
* Copyright notice with current year
* "Made with ♥ for culinary educators" message

**Functionality:**

* Smooth scrolling between sections
* Responsive design that adapts to all screen sizes
* Performance optimization for quick loading
* SEO metadata for improved search visibility
* Analytics tracking for conversion optimization
* Cookie consent mechanism for legal compliance
* Subtle parallax scrolling effects for visual interest

**2. Authentication Pages (login.html, register.html)**

**Primary Purpose:** Securely manage user access while creating a frictionless entry experience that encourages sign-ups and returns.

**Login Page (login.html)**

**Visual Design:**

* Clean, minimalist design with the same gradient background as the landing page
* Centered login form on a semi-transparent white card with subtle shadow
* HospoHub logo at the top of the card to reinforce branding
* Visual security indicators (lock icon, secure connection messaging)

**Form Elements:**

* Email input field with validation
* Password field with toggleable visibility
* "Remember me" checkbox for convenience
* Large, prominent "Log In" button in primary brand colour
* Clear "Forgot Password?" link positioned below the login button
* Horizontal divider with "or" text separator

**Social Authentication:**

* Microsoft authentication button with logo
* Google authentication button with logo
* Clear explanation of benefits of social login (faster access, no password to remember)
* Privacy reassurance text explaining data usage

**Alternative Actions:**

* "Don't have an account?" text with prominent "Sign Up" link
* "Return to Homepage" link for those who navigated here by mistake
* Help/Support link for users experiencing difficulties

**Security Features:**

* CAPTCHA protection after multiple failed attempts
* Rate limiting to prevent brute force attacks
* Secure password handling with appropriate hashing
* Clear error messages that don't reveal account existence
* Session timeout configuration
* Automatic redirect to HTTPS if accessed via HTTP

**Registration Page (register.html)**

**Visual Design:**

* Consistent with login page for brand cohesion
* Progress indicator showing registration steps (1. Account Info, 2. Profile Setup, 3. Preferences)
* Slightly larger card to accommodate more form fields

**Form Elements:**

* Email input with validation and availability check
* Password field with strength meter and requirements list
* Password confirmation field with match validation
* First and last name fields
* School/institution name field
* Role selection (Teacher, Department Head, Administrator)
* Terms of service and privacy policy checkboxes with links
* Marketing opt-in checkbox (pre-unchecked for compliance)

**Guidance Elements:**

* Tooltip explanations for each field
* Inline validation feedback (green checkmarks, red error messages)
* Password strength visualization
* Help text explaining the registration process
* Estimated completion time indicator

**Post-Registration:**

* Email verification system with resend option
* Welcome screen with next steps guidance
* Optional tutorial prompt
* First-time user onboarding flow

**Functionality:**

* Real-time field validation
* Duplicate email detection
* Secure password requirements enforcement
* AJAX form submission without page refresh
* Error handling with clear user feedback
* Registration analytics tracking
* Abandoned registration recovery (email reminder)

**Password Recovery (forgot-password.html)**

**Visual Design:**

* Consistent with other authentication pages
* Simpler form with focus on the recovery process
* Reassuring messaging about account security

**Form Elements:**

* Email input field with validation
* "Send Recovery Link" button
* Return to login link

**Process Visualization:**

* Simple step indicator showing the recovery process
* Email sent confirmation screen
* New password creation screen (accessed via emailed link)
* Success confirmation screen

**Security Features:**

* Time-limited recovery links (30 minutes)
* One-time use tokens
* Account lockout after multiple recovery attempts
* Email confirmation with masked address (j\*\*\*\*@example.com)
* IP address logging for suspicious activity detection

**3. Dashboard (dashboard.html)**

**Primary Purpose:** Serve as the command center for teachers to access all system features, see important information at a glance, and quickly navigate to commonly used functions.

**Visual Design:**

* Full-width layout with fixed sidebar navigation
* Color-coded sections for easy visual scanning
* Custom iconography for each dashboard widget
* Responsive design that reflows for smaller screens

**Page Structure:**

* Fixed top navigation bar with user profile and global actions
* Left sidebar with categorized navigation links and collapse option
* Main content area with gridded dashboard widgets
* Bottom status bar with system information and quick actions

**Top Navigation Bar:**

* HospoHub logo linking to dashboard
* Global search feature with advanced filters
* Notification bell with unread count indicator
* User profile dropdown with:
  + User name and avatar
  + Role indicator
  + Quick settings access
  + Logout option
* Help/support button
* Night mode toggle

**Side Navigation:**

* Categorized links to all major system areas:
  + Recipes section
  + Classes section
  + Pantry section
  + Shopping section
  + Reports section
  + Settings section
* Visual indicators for sections with notifications
* Collapse button to maximize screen space
* Quick-add dropdown for commonly created items
* Keyboard shortcut indicators for power users

**Dashboard Widgets:**

1. **Welcome & Overview Widget:**
   * Personalized greeting with user name
   * Current date and upcoming classes
   * Quick statistics (total recipes, active classes, etc.)
   * System announcements or tips
2. **Upcoming Classes Widget:**
   * Timeline view of the next 5 classes
   * Date, time, and location information
   * Student count and assigned recipes
   * Quick actions: view details, edit, cancel
   * Colour coding based on preparation status
3. **Recent Recipes Widget:**
   * Grid of recently viewed or edited recipes
   * Thumbnail images and basic information
   * Quick-access buttons for common actions
   * "View All" link to recipe management
4. **Pantry Status Widget:**
   * Visual gauge showing overall pantry status
   * Low stock alerts with quick reorder buttons
   * Expiring items notifications
   * Quick link to inventory management
5. **Shopping List Widget:**
   * Active shopping lists with completion percentages
   * Due dates and associated classes
   * Quick actions to view or edit lists
   * Price comparison summary
6. **Activity Feed Widget:**
   * Chronological list of recent system activities
   * User attribution for multi-user environments
   * Time stamps and contextual icons
   * Action buttons for related tasks
7. **Quick Actions Widget:**
   * Large, prominent buttons for common tasks:
     + Add New Recipe
     + Create Shopping List
     + Schedule Class
     + Take Inventory
   * Usage-based suggestions that adapt to work patterns
8. **Calendar Widget:**
   * Month view of scheduled classes and events
   * Color-coded by class or event type
   * Quick add event functionality
   * Synchronization status with external calendars

**Customization Options:**

* Drag-and-drop widget reordering
* Widget size adjustment (compact/expanded)
* Hide/show specific widgets
* Color theme selection
* Layout density options

**Functionality:**

* Real-time updates for notifications
* Cached data for offline viewing
* Personalization based on user behaviour
* Keyboard navigation support
* Screen reader compatibility
* Touch optimization for tablet use
* Widget state persistence between sessions

**4. Recipe Management Pages**

**4.1 Recipe Listing (recipes/index.html)**

**Primary Purpose:** Provide an organized, searchable catalogue of all recipes with efficient filtering and batch operations.

**Visual Design:**

* Clean grid layout with consistent recipe cards
* Toggle between grid and list views
* Subtle animations for state changes
* Visual indicators for recipe properties (vegetarian, allergens, etc.)

**Header Section:**

* Page title with recipe count
* View toggle buttons (grid/list)
* Add New Recipe button
* Batch operations dropdown (when items selected)
* Display density options

**Search & Filter Panel:**

* Full-text search field with auto-suggestions
* Advanced search toggle revealing:
  + Ingredient inclusion/exclusion
  + Preparation time range
  + Cooking time range
  + Difficulty level
  + Rating range
* Category filter with checkboxes and counts
* Dietary restriction filters (vegetarian, vegan, etc.)
* Allergen exclusion filters
* Author/creator filter
* Date range filter
* Clear all filters button
* Save search button for frequently used filters

**Sorting Options:**

* Sort dropdown with options:
  + Alphabetical (A-Z/Z-A)
  + Recently added/updated
  + Preparation time (shortest/longest)
  + Popularity (most used)
  + Rating (highest/lowest)
* Custom sort option for personal preference

**Recipe Cards:**

* Consistent aspect ratio thumbnail images
* Recipe title with ellipsis for long names
* Key information display:
  + Preparation time
  + Cooking time
  + Difficulty level
  + Serving size
* Visual badges for dietary information
* Rating display with stars
* Quick action buttons on hover:
  + View details
  + Edit recipe
  + Add to class
  + Add to shopping list
* Selection checkbox for batch operations
* Last used/updated timestamp
* Author attribution

**Pagination Controls:**

* Previous/next buttons
* Page number indicators
* Items per page selector
* Total items counter

**Batch Operations:**

* Select all/none toggle
* Delete selected
* Categorize selected
* Export selected
* Print selected
* Add selected to class
* Add selected to shopping list

**Empty States:**

* First-time user prompt to add recipes
* No search results guidance with filter adjustment suggestions
* Quick-add recipe button
* Sample recipes import option

**Functionality:**

* Lazy loading of recipe cards for performance
* Instant search results as typing occurs
* Filter combinations with logical operators
* Drag-and-drop organization in custom sort mode
* Multi-select with keyboard shortcuts
* Tag-based filtering system
* Search history with quick access to recent searches
* Browser history integration for back button support
* Filter state persistence between sessions

**4.2 Recipe Detail (recipes/view.html)**

**Primary Purpose:** Present a comprehensive view of a recipe with all relevant information in a well-organized, visually appealing format suitable for both screen viewing and printing.

**Visual Design:**

* Clean, spacious layout with clear section delineation
* High-contrast text for readability
* Large, high-quality hero image
* Print-friendly styling with @media print rules

**Header Section:**

* Recipe title in large, prominent typography
* Author attribution with avatar
* Creation/modification dates
* Rating display with user count
* Save/favorite button
* Print button
* Share button with dropdown options
* Back to listing button

**Recipe Summary:**

* Brief description paragraph
* Key metrics in horizontal layout:
  + Preparation time
  + Cooking time
  + Total time
  + Difficulty level
  + Servings/yield
* Adjustable serving size control with real-time quantity updates
* Dietary and allergen information with visual badges
* Recipe categories and tags with clickable links

**Ingredients Section:**

* Clear section heading with ingredient count
* Organized ingredients list with:
  + Checkbox for each ingredient for tracking during cooking
  + Precise quantities with both metric and imperial units
  + Ingredient names with optional links to substitutions
  + Preparation notes in italics (e.g., "finely chopped")
* Unit conversion toggle (metric/imperial)
* Optional grouping by recipe sections (e.g., "For the sauce")
* Visual indication of pantry availability status
* One-click "Add missing to shopping list" button

**Instructions Section:**

* Numbered steps with clear delineation
* Optional step images for complex techniques
* Estimated time for each step where applicable
* Temperature guidelines with conversion options
* Equipment needed for each step
* Technique tips in callout boxes
* Timer button next to time-sensitive steps

**Notes Section:**

* Author's notes and tips
* Common substitutions
* Make-ahead instructions
* Storage and freezing guidance
* Scaling considerations for large batches
* User-contributed notes (if enabled)

**Nutritional Information:**

* Per serving breakdown
* Clear visualization of macronutrients (carbs, protein, fat)
* Detailed nutrient table with daily value percentages
* Allergen warnings prominently displayed
* Calorie information with optional detailed breakdown

**Media Gallery:**

* Thumbnail strip of additional recipe images
* Video tutorials where available
* Step-by-step photo sequence option
* Full-screen image viewer

**Related Content:**

* Similar recipes suggestions
* "Pairs well with" recommendations
* Recommended cooking equipment
* Class usage history

**User Interaction:**

* Comment section for questions and feedback
* Rating submission with optional review
* Recipe correction suggestion form
* Social sharing options

**Chef Actions:**

* Edit recipe button
* Clone recipe button
* Delete recipe button
* Add to class dropdown
* Generate shopping list button
* Add to meal plan button

**Functionality:**

* Real-time serving size adjustment with quantity recalculation
* Measurement unit conversion between systems
* Step completion tracking during cooking
* Cooking mode with enlarged text and screen-always-on
* Progress saving between sessions
* Offline availability of viewed recipes
* Print formatting optimization
* Email/share functionality
* Timer functionality for cooking steps
* Ingredient checking against pantry inventory
* Voice control for hands-free cooking (optional)

**4.3 Recipe Editor (recipes/edit.html, recipes/add.html)**

**Primary Purpose:** Provide an intuitive, comprehensive interface for creating and editing recipes with advanced features for professional culinary education.

**Visual Design:**

* Clean, distraction-free interface
* Split-pane view option for preview while editing
* Context-sensitive help tooltips
* Visual feedback for validation and saving

**Form Structure:**

* Multi-section form with collapsible panels
* Progress indicator showing completion status
* Autosave functionality with status indicator
* Draft/published status toggle

**Basic Information Section:**

* Recipe title field with character counter
* Short description text area with formatting options
* Category selection with multi-select capability
* Tags input with auto-suggestions
* Cuisine type dropdown
* Difficulty level selector (slider or star rating)
* Preparation time input with hours/minutes
* Cooking time input with hours/minutes
* Servings/yield input with description field

**Image Management:**

* Primary image upload with drag-and-drop
* Thumbnail cropping tool
* Additional image uploads for step-by-step photos
* Image rearrangement via drag-and-drop
* Camera access for direct photo capture
* Image optimization options
* Alternative text input for accessibility

**Ingredients Section:**

* Dynamic ingredient list with add/remove functionality
* For each ingredient:
  + Quantity input with unit selection
  + Ingredient name with autocomplete from database
  + Preparation method input (e.g., "chopped")
  + Optional field (checkbox)
  + Drag handle for reordering
* Group ingredients functionality with section headings
* Bulk import option for pasting ingredient lists
* Standardized measurement conversion
* Store unit specification for shopping
* Pantry availability indicator

**Instructions Section:**

* Step-by-step instruction editor
* Rich text formatting for each step
* Add step button with intelligent numbering
* Step reordering via drag-and-drop
* Option to attach image to each step
* Time and temperature inputs where applicable
* Equipment specification for each step
* Technique link insertion
* Video embedding capability

**Nutritional Information:**

* Automatic calculation based on ingredients
* Manual override capability for verified data
* Per serving breakdown
* Allergen automatic detection with manual verification
* Dietary classification checkboxes (vegetarian, vegan, etc.)

**Notes & Tips Section:**

* Rich text editor for chef's notes
* Storage instructions
* Make-ahead guidance
* Serving suggestions
* Common substitutions
* Scaling considerations

**Advanced Options:**

* Equipment list with quantity and specific models
* Wine pairing suggestions
* Seasonal availability indicator
* Cost calculation tools
* Recipe source attribution
* Copyright information
* Internal notes visible only to teachers

**Recipe Import:**

* File upload for documents, images, or PDFs
* URL input for web recipe import
* Text area for pasting recipe content
* AI processing status indicator
* Verification interface for extracted data
* Manual correction tools for AI extraction

**Form Actions:**

* Save as draft button
* Publish button
* Preview button
* Cancel button with unsaved changes warning
* Delete button with confirmation
* Duplicate recipe button

**Functionality:**

* Intelligent form validation with clear error messages
* Regular autosaving to prevent data loss
* Version history with comparison and restoration
* Keyboard shortcuts for efficient editing
* AI-powered ingredient extraction from text or images
* Nutritional calculation based on USDA database
* Allergen automatic detection and warning
* Unit conversion between measurement systems
* Recipe scaling preview
* Spell check and grammar suggestions
* Format cleaning when pasting from external sources
* Mobile-friendly input methods
* Offline editing capability
* Conflict resolution for simultaneous edits

**5. Student Calculator (calculator.html)**

**Primary Purpose:** Provide precise scaling of recipes for different class sizes while handling the complexities of culinary measurement conversion and practical quantity adjustments.

**Visual Design:**

* Split-screen layout showing original and scaled recipe
* Clear visual differentiation between original and scaled quantities
* Color-coding for quantity changes (increase/decrease)
* Intuitive controls with immediate visual feedback

**Header Section:**

* Page title "Student Calculator"
* Brief explanation of the tool's purpose
* Recipe selection dropdown with search
* Quick links to recently used recipes
* Help button with usage instructions

**Input Controls:**

* Recipe selection with:
  + Dropdown with search functionality
  + Recently used recipes quick access
  + Thumbnail and basic info display for selected recipe
* Scaling method selection:
  + By student count (primary method)
  + By multiplier/percentage
  + To fixed total serving count
* Student count input with:
  + Numeric input field
  + Plus/minus buttons for increments
  + Preset buttons for common class sizes
  + Class selection dropdown (pulls from classes module)
* Advanced options toggle revealing:
  + Rounding method selection
  + Unit preference selection
  + Scaling exceptions handling
  + Cost calculation toggle

**Recipe Display:**

* Side-by-side comparison of original vs. scaled
* For each ingredient:
  + Original quantity and unit
  + Scaled quantity and unit
  + Percentage change indicator
  + Store unit conversion with package count
* For each instruction:
  + Original text with embedded quantities
  + Adjusted text with scaled quantities
  + Time adjustments where applicable

**Scaling Information:**

* Original serving count
* New serving count
* Scaling factor display
* Cost comparison (original vs. scaled)
* Cost per serving calculation
* Equipment capacity warnings

**Special Handling Indicators:**

* Non-linear scaling alerts for certain ingredients
* Practical measurement rounding notifications
* Minimum quantity enforcements
* Maximum batch size warnings based on equipment

**Output Options:**

* Print scaled recipe button
* Save as new recipe button
* Add to class button
* Generate shopping list button
* Export to PDF button
* Email button

**Additional Tools:**

* Conversion calculator for ad-hoc measurements
* Cost estimator based on ingredients
* Equipment capacity checker
* Portion size visualizer
* Yield estimation tool

**Functionality:**

* Real-time calculation as inputs change
* Intelligent handling of non-linear ingredients
* Practical measurement rounding (e.g., no "1.33 eggs")
* Minimum quantity enforcement for critical ingredients
* Unit conversion between measurement systems
* Store package size consideration for shopping
* Scaling limit warnings based on equipment
* Cost calculation based on current pricing
* Automatic time adjustment for scaled quantities
* Special consideration for baking formulas
* Baker's percentage calculation option
* Persistent settings between sessions
* Recipe scaling history for future reference
* Ability to save custom scaling presets

**6. Pantry Management (pantry.html)**

**Primary Purpose:** Maintain an accurate inventory of all ingredients with intuitive tools for tracking usage, identifying shortages, and managing stock rotation.

**Visual Design:**

* Organized grid layout with clear categorization
* Visual indicators for stock levels (green/yellow/red)
* Compact list view with essential information
* Expandable rows for detailed information
* Mobile-optimized interface with touch-friendly controls

**Header Section:**

* Page title "Pantry Management"
* Last inventory date display
* Quick action buttons:
  + Take inventory
  + Add new items
  + Generate shopping list
  + Print inventory
  + Export data
* Search bar with filters
* View toggle (grid/list)
* Category filter tabs

**Inventory Overview:**

* Summary statistics:
  + Total item count
  + Low stock item count
  + Expiring soon count
  + Estimated total value
* Quick filters for common views:
  + Low stock items
  + Expiring soon
  + Recently added
  + Frequently used
* Department/category breakdown with mini charts

**Inventory Grid:**

* Categorized sections with collapsible headers
* For each item:
  + Ingredient name
  + Current quantity with unit
  + Minimum stock level indicator
  + Status indicator (in stock/low/out)
  + Location information
  + Expiration date with warning
  + Last updated timestamp
  + Quick action buttons:
    - Update quantity
    - Add to shopping
    - View history
    - Edit details

**Item Detail View:**

* Comprehensive information panel:
  + Full ingredient details
  + Purchase history
  + Usage tracking
  + Price history
  + Preferred suppliers
  + Storage recommendations
  + Substitution options
  + Related recipes
* Stock level graph showing trends
* Usage prediction based on scheduled classes
* Barcode/QR code for quick scanning

**Inventory Management Tools:**

* Batch inventory update interface
* Barcode scanning capability for quick updates
* Voice input option for hands-free inventory
* Mass edit functionality for categories/locations
* Bulk import/export for initial setup
* Inventory count worksheet generator
* Variance analysis for inventory discrepancies

**Item Addition Form:**

* Quick add with minimal required fields
* Detailed add with comprehensive information
* Barcode scanning for automatic recognition
* Product lookup in external databases
* Duplicate detection and merging
* Batch addition for multiple items

**Stock Movement Interface:**

* Intuitive swipe gestures:
  + Swipe left to add to shopping list
  + Swipe right to update quantity
  + Long press for detailed options
* Tap to expand item details
* Drag-and-drop organization between categories
* Multi-select for batch operations

**Low Stock Management:**

* Configurable minimum stock levels per item
* Automatic low stock detection
* One-click addition to shopping list
* Threshold adjustment based on usage patterns
* Email/notification alerts for critical items
* Reorder recommendation engine

**Expiration Tracking:**

* Visual calendar of upcoming expirations
* Color-coded warnings for approaching dates
* Suggested usage recommendations for expiring items
* First-in-first-out (FIFO) guidance
* Batch management for items with same expiry
* Use-by vs. best-before differentiation

**Location Management:**

* Storage location assignment for each item
* Location map visualization option
* QR code generation for location labeling
* Storage condition recommendations
* Space utilization analysis
* Reorganization suggestions for efficiency

**Functionality:**

* Touch-optimized swipe interface for mobile
* Offline capability for inventory taking
* Barcode/QR code scanning support
* Automatic synchronization with shopping module
* Real-time updates across devices
* Historical tracking of inventory levels
* Usage pattern analysis and prediction
* Integration with recipe and class scheduling
* Automated low stock alerts
* Expiration reminders and alerts
* Export capabilities for external systems
* Inventory reconciliation tools
* Waste tracking and analysis

**7. Shopping List (shopping.html)**

**Primary Purpose:** Streamline the procurement process by generating optimized shopping lists with price comparison, store organization, and seamless integration with the pantry system.

**Visual Design:**

* Clean, task-oriented interface resembling a checklist
* Clear organization by department/category
* Visual price comparison elements
* Mobile-optimized for in-store use
* Print-friendly formatting

**Header Section:**

* Page title with current list name
* Shopping list selection dropdown
* Creation date and author information
* Associated class information
* Quick action buttons:
  + New list
  + Add items
  + Clear completed
  + Combine lists
  + Print/Export
* Status summary (items count, checked items, total cost)

**List Creation Panel:**

* New list creation form
* Recipe-based list generation:
  + Recipe selection with search
  + Student count adjustment
  + Class selection option
  + Date range for multiple classes
* Pantry-based list generation:
  + Low stock items auto-selection
  + Manual item selection
  + Minimum quantity threshold adjustment
* Template-based generation:
  + Saved list templates
  + Department essentials lists
  + Seasonal stock-up lists

**Item Management:**

* Add item interface:
  + Item name with auto-complete
  + Quantity and unit input
  + Department/category assignment
  + Note field for specifications
  + Price estimate field
* Batch item addition
* Import from text or spreadsheet
* Voice input for hands-free addition

**Shopping List View:**

* Organized by department/category with collapsible sections
* For each item:
  + Checkbox for completion tracking
  + Item name and details
  + Quantity with unit
  + Store unit conversion (e.g., "2 × 500g packages")
  + Recipe attribution (which recipe requires it)
  + Department indicator
  + Price at selected store
  + Special requests/notes
  + Swipe actions for mobile:
    - Swipe right to check off
    - Swipe left for options menu
    - Long press to edit

**Price Comparison:**

* Store selection interface:
  + Store tabs at the top
  + Store logos with distance information
  + Availability status per store
* For each store:
  + Item-by-item price breakdown
  + Package size variations
  + Total cost calculation
  + Savings comparison
  + Unavailable items highlighting
* Best value recommendations:
  + Overall best value store
  + Split shopping optimization
  + Cost vs. convenience analysis
* Price history trends
* Special deals and coupon integration

**Department Organization:**

* Category-based grouping
* Store-specific department ordering
* Store layout-based sequence
* Custom ordering capability
* Aisle information where available
* Location indicators for unfamiliar stores

**Shopping Mode:**

* Simplified interface for in-store use
* Large touch targets for easy checking
* Current store focus with irrelevant items hidden
* Aisle-based navigation
* Voice control for hands-free shopping
* Barcode scanning for price verification
* Running total calculation
* Progress indicator

**Post-Shopping Process:**

* Purchased items transfer to pantry
* Partial purchase handling
* Receipt scanning for price updating
* Variance analysis (estimated vs. actual cost)
* Missed items rescheduling
* Shopping history recording

**Multi-Store Shopping:**

* Store-specific sub-lists
* Optimized route planning
* Split list by best value
* Store availability indicators
* Alternative store suggestions for out-of-stock items
* Delivery vs. pickup options comparison

**Sharing and Collaboration:**

* List sharing with other users
* Collaborative editing capabilities
* Assignment of items to different shoppers
* Progress synchronization across devices
* Comment/note addition to items
* Notification of changes

**Export Options:**

* Print-friendly formatting
* Email export
* PDF generation
* CSV/Excel export
* Text message format
* Integration with third-party shopping apps

**Functionality:**

* Real-time synchronization across devices
* Offline capability for in-store use
* Automatic updating based on pantry changes
* Intelligent sorting by store layout
* Price database updates and tracking
* Shopping pattern analysis
* List templates and favorites
* Recurring list generation
* Receipt capture and processing
* Voice input and control
* Barcode scanning support
* Geolocation for store-specific features
* Integration with loyalty programs (optional)
* Spending analysis and budgeting tools

**8. Class Management (classes.html)**

**Primary Purpose:** Plan, organize, and track culinary classes with comprehensive tools for recipe assignment, student management, and resource allocation.

**Visual Design:**

* Calendar-based visual overview
* Class cards with color-coding by type/level
* Clear information hierarchy for quick scanning
* Consistent color-coding for status indicators

**Header Section:**

* Page title "Class Management"
* View toggles:
  + Calendar view
  + List view
  + Timeline view
* Filter controls:
  + Date range selection
  + Class type filters
  + Teacher filters
  + Location filters
* Search functionality
* Add Class button
* Import/Export buttons

**Calendar View:**

* Month/week/day view options
* Class blocks with basic information:
  + Class name
  + Time and location
  + Student count
  + Recipe names
  + Status indicator
* Drag-and-drop scheduling
* Multi-day class visualization
* Resource conflict highlighting
* Color-coding by class type or teacher

**Class List View:**

* Sortable, filterable table of all classes
* For each class:
  + Name and description
  + Date and time
  + Location/kitchen
  + Teacher assigned
  + Student count with capacity
  + Recipes planned
  + Preparation status
  + Action buttons
* Bulk operations for multiple classes
* Expandable rows for additional details
* Status filtering and highlighting

**Class Detail View:**

* Comprehensive class information:
  + Full title and description
  + Complete schedule information
  + Location details with map
  + Teacher information with contact
  + Student roster with dietary notes
  + Assigned recipes with scaling
  + Equipment requirements
  + Preparation checklist
* Resource allocation:
  + Kitchen/classroom assignment
  + Equipment reservation
  + Ingredient requirements
  + Budget allocation
* Timeline visualization:
  + Preparation schedule
  + Cooking sequence
  + Serving timeline
  + Cleanup allocation

**Class Creation/Editing:**

* Multi-step form with:
  1. Basic Information:
     + Class title and description
     + Class type selection
     + Date and time selection
     + Duration setting
     + Recurring options
     + Location selection
  2. Student Management:
     + Manual student entry
     + Group/class import
     + Capacity setting
     + Waitlist options
     + Attendance tracking
     + Dietary restriction collection
  3. Recipe Planning:
     + Recipe search and selection
     + Sequencing and timing
     + Scaling configuration
     + Alternative recipes for dietary needs
     + Preparation notes
  4. Resource Allocation:
     + Equipment requirements
     + Ingredient planning
     + Budget estimation
     + Staff assignment
  5. Documentation:
     + Handout generation
     + Recipe printouts
     + Evaluation forms
     + Certificate templates

**Student Management:**

* Student roster with:
  + Name and contact information
  + Dietary restrictions and allergies
  + Skill level and previous classes
  + Attendance history
  + Special accommodations
  + Notes and feedback
* Attendance tracking interface
* Group management for recurring students
* Dietary restriction visualization
* Skill progression tracking
* Communication tools for announcements

**Recipe Planning:**

* Recipe assignment interface:
  + Search and filter functionality
  + Recently used recipes
  + Favorite recipes
  + Drag-and-drop sequencing
* Recipe scaling based on student count
* Recipe compatibility checking with dietary needs
* Preparation timeline generation
* Equipment requirements consolidation
* Shopping list generation

**Resource Management:**

* Kitchen/classroom booking system
* Equipment reservation and conflict detection
* Ingredient requirement calculation
* Budget estimation and tracking
* Staff assignment and scheduling
* Resource utilization reports

**Class Materials:**

* Automatic generation of handouts and materials
* Recipe cards with class-specific scaling
* Preparation checklists for students
* Equipment lists and setup diagrams
* Evaluation forms and feedback collection
* Certificate generation for completion
* Custom material templates

**Preparation Timeline:**

* Interactive timeline visualization
* Preparation tasks with dependencies
* Critical path highlighting
* Task assignment to students or groups
* Time estimates and deadlines
* Progress tracking and status updates
* Notification system for upcoming deadlines

**Post-Class Processing:**

* Attendance recording interface
* Student performance evaluation
* Ingredient usage reconciliation
* Equipment condition reporting
* Waste tracking and analysis
* Student feedback collection and analysis
* Class cost finalization

**Class Templates:**

* Save class as template functionality
* Template library with categorization
* Quick class creation from templates
* Template sharing between teachers
* Seasonal template collections
* Curriculum-based template series

**Reporting and Analysis:**

* Class attendance statistics
* Student progress tracking
* Resource utilization reports
* Cost analysis by class type
* Popularity metrics for recipes
* Teacher performance metrics
* Dietary accommodation frequency

**Functionality:**

* Drag-and-drop scheduling interface
* Conflict detection for resources
* Automatic scaling of recipes
* Intelligent resource allocation
* Dietary restriction compliance checking
* Material generation and distribution
* Student communication tools
* Attendance and performance tracking
* Integration with recipe and pantry modules
* Budget tracking and reporting
* Calendar integration with external systems
* Mobile support for in-class management
* Offline capability for attendance taking
* Feedback collection and analysis

**9. Settings (settings.html)**

**Primary Purpose:** Provide comprehensive configuration options for all system aspects while ensuring a user-friendly experience for teachers with varying technical skills.

**Visual Design:**

* Clean, organized tab-based interface
* Clear section headings and groupings
* Visual feedback for setting changes
* Mobile-responsive layout that adapts to screen size

**Header Section:**

* Page title "Settings"
* Save button with status indicator
* Reset to defaults option
* Search settings functionality
* Help documentation link

**Tab Navigation:**

* Horizontally scrollable tab bar on mobile
* Clear icons and labels for each section
* Visual indicator for sections with unsaved changes
* Most frequently used tabs prioritized

**General Settings Tab**

**User Profile Section:**

* User information display and editing:
  + Name and title
  + Profile picture upload/management
  + Contact information
  + Role and permissions
  + Biography for shared environments
* Account security settings:
  + Password change interface
  + Two-factor authentication setup
  + Session management
  + Login history

**Interface Preferences:**

* Theme selection:
  + Light theme
  + Dark theme
  + High contrast theme
  + System preference following
* Color accent customization
* Font size adjustment
* Animation toggle and reduction
* Notification preferences:
  + Email notifications
  + In-app notifications
  + Push notifications (mobile)
  + Notification frequency and bundling

**Regional Settings:**

* Language selection with 10+ language options
* Date and time format preferences
* Measurement system (Metric/Imperial/Both)
* Temperature unit (°C/°F)
* First day of week selection
* Currency display format

**Default Values:**

* Default servings for new recipes
* Default class size
* Default preparation time increments
* Default view for recipe listing
* Default shopping list sorting
* Default pantry categories

**Recipe Settings Tab**

**Recipe Creation Defaults:**

* Default recipe category
* Default difficulty level
* Default recipe visibility
* Template selection for new recipes
* Copyright notice template
* Source attribution format

**Recipe Display Options:**

* Show/hide nutritional information
* Show/hide cost information
* Show/hide preparation steps as numbered/bullet
* Image size preferences
* Instruction display density
* Print formatting options

**AI Extraction Settings:**

* Enable/disable AI extraction features
* Confidence threshold adjustment
* Default handling of uncertain extractions
* Language processing preferences
* OCR optimization settings
* Extraction history retention

**Measurement Preferences:**

* Primary measurement system
* Secondary measurement display toggle
* Fraction vs. decimal display
* Rounding precision for scaling
* Volume to weight conversion preferences
* Special handling for specific ingredients

**Class Settings Tab**

**Class Creation Defaults:**

* Default class duration
* Default student capacity
* Default location/kitchen
* Default class type
* Recurring class templates
* Preparation time buffer

**Student Management:**

* Student information requirements
* Dietary restriction tracking options
* Skill level tracking configuration
* Attendance policy settings
* Waitlist management preferences
* Student communication templates

**Resource Allocation:**

* Equipment categories and inventory
* Facility information and constraints
* Staff role definitions
* Budget categories and limits
* Resource reservation rules
* Conflict resolution preferences

**Documentation Settings:**

* Handout templates and branding
* Certificate design and requirements
* Evaluation form configuration
* Report generation preferences
* Electronic distribution options
* Accessibility options for materials

**Pantry Settings Tab**

**Inventory Configuration:**

* Low stock threshold calculation method
* Expiration tracking preferences
* Location management setup
* Barcode scanning configuration
* Inventory count frequency
* Variance tolerance settings

**Stock Movement:**

* Automatic deduction from recipes
* Waste tracking configuration
* Stock adjustment approval workflow
* Transfer between locations settings
* Historical data retention period
* Usage prediction settings

**Categorization:**

* Ingredient category management
* Storage location definition
* Custom attribute configuration
* Tag system setup
* Hierarchical category structure
* Auto-categorization rules

**Alerting:**

* Low stock notification thresholds
* Expiration warning timeframes
* Critical item designation
* Alert delivery methods
* Alert frequency and bundling
* Escalation rules for critical items

**Shopping Settings Tab**

**Store Configuration:**

* Store management interface:
  + Store name and details
  + Location and contact information
  + Operating hours
  + Department layout
  + Special notes and accounts
* Default store selection
* Store preference ordering
* Distance calculation method

**Price Management:**

* Price data sources configuration
* Manual price entry preferences
* Price history retention
* Price update frequency
* Sale detection settings
* Unit price calculation method

**Shopping List Behavior:**

* Default sorting method
* Grouping preferences
* Checked item behavior
* Multiple list management
* List template configuration
* Recurring list settings

**Export Preferences:**

* Default export format
* Print layout customization
* Email template configuration
* Mobile formatting preferences
* Sharing permissions
* External app integration

**Supplier Settings Tab**

**Supplier Management:**

* Complete supplier database with:
  + Contact information
  + Account numbers
  + Delivery schedules
  + Product specialties
  + Payment terms
  + Performance history
* Supplier categorization
* Preferred supplier designation
* Order history tracking
* Pricing agreement management
* Quality rating system

**Ordering Process:**

* Order template configuration
* Approval workflow setup
* Order submission methods
* Order tracking preferences
* Receiving process configuration
* Variance handling procedures

**Departments & Categories Tab**

**Department Configuration:**

* Department creation and management
* Color coding system
* Default sorting order
* Department visibility settings
* Department templates
* Hierarchy configuration

**Ingredient Categories:**

* Category management interface
* Subcategory configuration
* Category assignment rules
* Default categories for new items
* Category merging tools
* Category export/import

**Storage Locations:**

* Location definition and hierarchy
* Area capacity settings
* Storage condition specifications
* Item compatibility rules
* Location labeling system
* Map visualization options

**Dietary & Allergens Tab**

**Allergen Management:**

* Comprehensive allergen database
* Severity classification system
* Cross-contamination risk settings
* Allergen labeling preferences
* Alert threshold configuration
* Substitution suggestion settings

**Dietary Restriction Tracking:**

* Dietary category definition (vegetarian, vegan, etc.)
* Religious dietary compliance settings
* Medical diet configuration
* Preference vs. requirement distinction
* Recipe compatibility checking rules
* Automatic flagging settings

**Nutritional Analysis:**

* Nutritional database selection
* Calculation method configuration
* Display preferences
* Daily value reference selection
* Portion size standardization
* Rounding rules for values

**Cloud Sync Tab**

**Synchronization Setup:**

* Cloud provider configuration:
  + Microsoft account connection
  + Google account connection
  + Custom server configuration
* Sync frequency settings
* Automatic vs. manual sync
* Conflict resolution preferences
* Bandwidth limitation options
* Offline mode settings

**Data Management:**

* Selective sync options for data types
* Historical data retention policies
* Storage usage monitoring
* Data purging and archiving tools
* Backup schedule configuration
* Version history settings

**Sharing Settings:**

* User permission management
* Shared folder configuration
* Collaboration settings
* External sharing controls
* Auditing and access logs
* Link expiration settings

**Export & Import Tab**

**Data Export:**

* Complete system backup
* Selective export by module
* Format selection (JSON, CSV, Excel)
* Scheduling automatic exports
* Export location configuration
* Password protection options

**Data Import:**

* Import interface for all data types
* Validation and error handling
* Duplicate detection settings
* Merge vs. replace options
* Batch import tools
* Import history tracking

**System Reset:**

* Selective reset options
* Complete system reset
* Configuration preservation options
* Confirmation mechanism
* Backup before reset functionality
* Recovery from backup interface

**Functionality:**

* Real-time validation of setting changes
* Contextual help with detailed explanations
* Search across all settings
* Settings export and import
* Role-based setting visibility
* Default templates for quick setup
* Setting history tracking
* Automatic testing of integration settings
* Mobile-friendly settings interface
* Guided setup wizards for complex configurations

**10. Additional Pages**

**10.1 Reports & Analytics (reports.html)**

**Primary Purpose:** Generate actionable insights and comprehensive reporting on all aspects of the system to improve culinary education outcomes and operational efficiency.

**Visual Design:**

* Dashboard-style layout with data visualizations
* Interactive charts and graphs
* Exportable tables with clear formatting
* Print-optimized views for physical reports

**Header Section:**

* Page title "Reports & Analytics"
* Date range selector
* Report type dropdown
* Quick filter presets
* Export/Print/Share buttons
* Refresh data button
* Saved reports access

**Report Categories:**

1. **Usage Reports:**
   * Recipe utilization frequency
   * Most/least used recipes
   * Recipe rating and feedback analysis
   * Search term analysis
   * Feature usage statistics
   * User activity timelines
   * System adoption metrics
2. **Inventory Reports:**
   * Current inventory valuation
   * Stock level history and trends
   * Consumption rate analysis
   * Low stock frequency by item
   * Expiration loss tracking
   * Inventory turnover ratio
   * Supplier performance metrics
   * Order history and spending
3. **Class Reports:**
   * Class schedule and utilization
   * Attendance statistics
   * Student performance metrics
   * Recipe success rate by class
   * Equipment utilization
   * Facility usage optimization
   * Teacher productivity analysis
   * Class cost vs. budget variance
4. **Financial Reports:**
   * Ingredient cost trends
   * Recipe cost analysis
   * Budget vs. actual spending
   * Cost per student metrics
   * Supplier price comparison
   * Waste cost quantification
   * ROI on equipment investment
   * Department-wide financial overview
5. **Educational Reports:**
   * Curriculum coverage analysis
   * Skill progression tracking
   * Technique exposure frequency
   * Learning objective achievement
   * Student feedback analysis
   * Knowledge retention metrics
   * Certification completion rates
   * Educational outcome correlations

**Report Builder:**

* Custom report creation interface
* Drag-and-drop field selection
* Filter and parameter configuration
* Visualization type selection
* Calculation and formula editor
* Scheduling for automatic generation
* Distribution list management
* Format selection (PDF, Excel, etc.)

**Dashboard Builder:**

* Custom dashboard creation tools
* Widget selection and arrangement
* Data source configuration
* Auto-refresh settings
* Permission and sharing settings
* Mobile view configuration
* Alerting based on metrics

**Data Visualization Tools:**

* Line charts for trends
* Bar/column charts for comparisons
* Pie/donut charts for proportions
* Heat maps for frequency analysis
* Scatter plots for correlations
* Gauge charts for goal tracking
* Timeline visualizations for scheduling
* Geospatial maps for regional analysis

**Advanced Analytics:**

* Predictive demand forecasting
* Ingredient price trend analysis
* Recipe popularity prediction
* Student performance forecasting
* Anomaly detection for inventory
* Pattern recognition in usage data
* Cost optimization suggestions
* Resource allocation recommendations

**Report Sharing:**

* Export in multiple formats
* Scheduled email delivery
* Shared dashboard links
* Embedded reports for other systems
* Print optimization
* Mobile report viewing
* Permission-based access control

**Functionality:**

* Interactive filtering and drilling
* Real-time data updates
* Automated report scheduling
* Alert configuration based on metrics
* Customizable visualizations
* Comprehensive export options
* Data analysis with statistical tools
* Mobile-optimized dashboard views

**10.2 Help & Support (help.html)**

**Primary Purpose:** Provide comprehensive assistance resources to ensure users can effectively utilize all system features and troubleshoot common issues.

**Visual Design:**

* Clean, accessible interface with clear navigation
* Prominent search functionality
* Organized content hierarchy
* Video thumbnails and visual aids
* Step-by-step guides with screenshots

**Header Section:**

* Page title "Help & Support"
* Prominent search bar
* Quick navigation to common topics
* Contact support button
* Community forum link
* Help categories menu

**Help Center Home:**

* Getting started quick links
* Most popular help articles
* Recently updated resources
* Video tutorial showcase
* Contextual help based on recent activity
* Personalized suggestions based on role

**Knowledge Base:**

* Comprehensive article library
* Hierarchical category organization
* Article rating and feedback
* Related article suggestions
* Printable version option
* Last updated timestamp
* Contributor information
* Version applicability indicators

**Video Tutorials:**

* Categorized video gallery
* Short-form tutorials (2-3 minutes)
* In-depth feature walkthroughs
* Skill-building series
* Closed captioning support
* Transcript availability
* Downloadable option for offline viewing
* Video quality selection

**Interactive Guides:**

* Step-by-step walkthroughs
* Interactive simulations for complex features
* Practice environments for learning
* Progress tracking for multi-step processes
* Checkpoint quizzes for comprehension
* Completion certificates for training

**Troubleshooting:**

* Common issues database
* Problem diagnosis wizard
* Step-by-step resolution guides
* Error message lookup
* System status indicators
* Network connectivity checker
* Data validation tools
* Recovery procedures

**FAQs Section:**

* Categorized frequently asked questions
* Expandable answers for easy scanning
* Related question suggestions
* User voting for helpful answers
* Contribution option for missing answers
* Context-specific FAQ filtering

**Community Support:**

* User forums with categorized discussions
* Question and answer section
* Feature request tracking
* Knowledge sharing platform
* Expert user highlighting
* Gamification for helpful contributions
* Moderator-verified answers

**Direct Support:**

* Support ticket submission
* Live chat option during business hours
* Screen sharing request capability
* File attachment for examples
* Ticket status tracking
* Support history logging
* Satisfaction feedback collection

**Self-Service Tools:**

* Account management utilities
* Password reset functionality
* Data export tools
* Cache clearing utilities
* Connection diagnostics
* Performance optimization tools
* Storage management utilities

**Training Resources:**

* Structured learning paths
* Skill-based certification tracks
* Printable quick reference guides
* Keyboard shortcut cheat sheets
* Template libraries for common tasks
* Best practice documents
* Case studies of effective usage

**Functionality:**

* Smart search with predictive suggestions
* Context-sensitive help triggered from main app
* Article rating and feedback collection
* User contribution system for knowledge base
* Usage analytics to improve help content
* Multi-format content (text, video, interactive)
* Accessibility compliance for all materials
* Mobile optimization for on-the-go assistance
* Offline access to downloaded help content

**10.3 Import & Data Management (import.html)**

**Primary Purpose:** Facilitate efficient data migration, bulk operations, and system integration to reduce manual data entry and ensure data consistency.

**Visual Design:**

* Process-oriented interface with clear steps
* Progress indicators for batch operations
* Visual feedback for validation results
* Clean tabular data displays with highlighting

**Header Section:**

* Page title "Import & Data Management"
* Process step indicator
* Help documentation link
* Cancel operation button
* Save progress button

**Import Sources:**

* File upload interface
  + Drag-and-drop area
  + File browser button
  + Supported format list
  + Size limitations
  + Template downloads
* External system connections
  + Integration API configuration
  + Authentication setup
  + Connection testing
  + Sync frequency settings
* Text paste area
  + For quick clipboard data
  + Format detection
  + Structure suggestion
* URL import
  + Web recipe extraction
  + Site authentication if needed
  + Preview functionality
* Barcode scanning
  + Camera access for scanning
  + Bulk barcode list input
  + Database lookup configuration

**Import Types:**

* Recipe import
  + Recipe details mapping
  + Ingredient parsing options
  + Image handling preferences
  + Categorization rules
  + Duplicate handling policy
* Inventory import
  + Stock level format
  + Location mapping
  + Unit standardization
  + Category assignment
  + Supplier association
* Supplier import
  + Contact information formats
  + Product catalog handling
  + Pricing structure import
  + Contract terms mapping
* Student/Class import
  + Roster format mapping
  + Dietary restriction encoding
  + Schedule information handling
  + Historical data import options

**Data Mapping Interface:**

* Source field identification
* Target field matching
* Data type validation
* Required field highlighting
* Transformation rule configuration
* Default value assignment
* Conditional mapping logic
* Preview of mapped results

**Validation & Review:**

* Automatic data validation
* Error and warning highlighting
* Required field checking
* Format validation
* Duplicate detection
* Reference integrity checking
* Mass correction tools
* Validation rule configuration

**Import Processing:**

* Batch size configuration
* Priority setting
* Background processing option
* Notification preferences
* Cancelation capability
* Pause/resume functionality
* Detailed progress tracking
* Error handling preferences

**Results & Reporting:**

* Import summary statistics
* Success/failure breakdown
* Detailed error logs
* Record-by-record status
* Searchable result table
* Export capability for results
* Rollback option for failed imports
* Follow-up action recommendations

**Data Export:**

* Comprehensive export options
* Format selection (CSV, Excel, JSON)
* Field selection interface
* Filter configuration
* Sort order specification
* Batch size settings
* Scheduling capability
* Destination configuration

**Data Cleanup Tools:**

* Duplicate detection and merging
* Orphaned record identification
* Consistency checking
* Mass update tools
* Category reassignment
* Tag management
* Data standardization tools
* Archive and purge utilities

**Functionality:**

* Template-based importing
* Scheduled automatic imports
* Custom field mapping profiles
* Intelligent field type detection
* Data transformation rules
* Validation customization
* Error correction workflows
* Transaction support for rollbacks
* Audit logging of all changes
* Performance optimization for large datasets