

# Module-wise Functional Specification

## Product

**learntoaction** – Learning Execution SaaS Platform

This document translates the PRD + TAD into **implementation-ready functional modules**. Each module defines scope, responsibilities, key workflows, and acceptance criteria.

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## 1. Authentication & Authorization Module

### Responsibilities

- User authentication
- Role-based access control (RBAC)
- Workspace-level permission enforcement

### Roles Supported

- Super Admin
- Teacher
- Student

### Functional Requirements

- Email + password authentication
- Magic link / OTP (optional, phase 2)
- JWT-based session management
- Role validation on every request
- Workspace context resolution per request

### Acceptance Criteria

- Users cannot access resources outside their workspace
  - Students cannot access teacher dashboards
  - Super Admin can access all workspaces
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## 2. Workspace Management Module

### Responsibilities

- Workspace lifecycle
- Tenant isolation

- Branding configuration

### **Functional Requirements**

- Create workspace on teacher signup
- One workspace per teacher
- Store branding settings:
  - Brand name
  - Business name
  - Logo
  - Colors
  - Fonts
- Workspace-level settings page

### **Acceptance Criteria**

- Branding applies to all public-facing pages
  - Workspace data is fully isolated
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## **3. Domain & SSL Management Module**

### **Responsibilities**

- Default and custom domain handling
- SSL provisioning

### **Functional Requirements**

- Auto-generate default subdomain
- Allow teacher to add custom domain
- Show CNAME target and DNS instructions
- Verify domain ownership
- Auto-provision SSL certificates
- Show domain status (pending / active / error)

### **Acceptance Criteria**

- Custom domain resolves to correct workspace
  - SSL is enforced on all domains
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## **4. Content Organization Module (Folders & Views)**

### **Responsibilities**

- Content discoverability

- Folder hierarchy

### **Functional Requirements**

- Create nested folders
- Rename and delete folders
- Drag worksheets/workbooks into folders
- Views:
  - List
  - Grid
  - Recent
- Global search
- Sorting & filtering

### **Acceptance Criteria**

- Folder changes reflect instantly
  - Search returns only workspace-owned content
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## **5. Worksheet Management Module**

### **Responsibilities**

- Standalone worksheet lifecycle

### **Functional Requirements**

- Create, edit, duplicate, soft-delete worksheets
- Draft / published status
- Editable unique slug
- Preview in new tab
- Track created\_at and updated\_at

### **Acceptance Criteria**

- Draft worksheets are not publicly accessible
  - Published worksheets render correctly
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## **6. Workbook Management Module**

### **Responsibilities**

- Multi-page learning flow management

## Functional Requirements

- Create workbook
- Add, reorder, rename, delete pages
- Each page references a worksheet snapshot
- Import worksheet (copy-only)
- Editable unique slug

## Acceptance Criteria

- Reordering pages updates navigation correctly
  - Imported worksheets are independent copies
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# 7. Worksheet Builder Module

## Responsibilities

- Interactive content creation

## Functional Requirements

- Drag-and-drop block editor
- Supported blocks:
  - Text (rich formatting)
  - Inputs (single/multi-line)
  - Checkboxes, radio, dropdown
  - Media (image, video)
  - Progress bar
  - Divider
  - Finish button
  - Dynamic field
  - Dynamic custom value
- Grid layout with columns and rows
- No nested rows inside rows
- Autosave on change

## Acceptance Criteria

- Blocks can be reordered across columns
  - Autosave persists state reliably
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## 8. Field System Module

### Responsibilities

- Structured data generation

### Functional Requirements

- Auto-generate field name and field key
- Enforce uniqueness per workspace
- Prevent editing of field keys
- Alert on duplicate field generation
- Allow URL parameter injection
- Support cross-worksheet rendering

### Acceptance Criteria

- Duplicate field keys are impossible
  - Fields persist across worksheets
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## 9. Custom Fields & Values Module

### Responsibilities

- Global dynamic variables

### Functional Requirements

#### Custom Fields Manager

- List all generated fields
- Search fields
- Show usage count

#### Custom Values Manager

- Create key-value pairs
- Render values via template syntax

### Acceptance Criteria

- Updating custom values reflects everywhere
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## 10. Student Runner Module

### Responsibilities

- Student-facing experience

### Functional Requirements

- Access worksheets/workbooks via link
- Optional login to save progress
- Autosave responses
- Resume progress
- Show progress indicator
- Next / previous navigation in workbooks
- Privacy toggle (shared / private)

### Acceptance Criteria

- Students can resume from last state
  - Progress is accurately calculated
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## 11. Student Management Module

### Responsibilities

- Teacher visibility into learners

### Functional Requirements

- Global student directory
- Search by name/email
- Filter by:
  - Active / inactive
  - Workbook
- Display:
  - Completion %
  - Worksheets completed
  - Workbooks completed
  - Last active
  - Privacy status

### Acceptance Criteria

- Student metrics update in near real-time
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## 12. Response Management Module

### Responsibilities

- Persist student input

### Functional Requirements

- Autosave partial responses
- Version responses
- Track progress state
- Soft delete responses

### Acceptance Criteria

- No data loss during refresh or navigation
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## 13. Analytics Module

### Responsibilities

- Behavioral insight generation

### Functional Requirements

- Event-based tracking
- Dashboards:
  - Overview
  - Student analytics
  - Worksheet analytics
  - Workbook analytics
  - Field analytics
  - Device & traffic
- Filters by date, workbook, worksheet

### Acceptance Criteria

- Analytics reflect real user behavior
  - No PII leakage across workspaces
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## 14. Super Admin Module

### Responsibilities

- Platform governance

## Functional Requirements

- View all workspaces
- View global analytics
- Moderate content
- Manage plans and limits

## Acceptance Criteria

- Super Admin access bypasses workspace isolation safely
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# 15. System Utilities Module

## Responsibilities

- Platform reliability

## Functional Requirements

- Activity logs
  - Soft delete & recovery
  - Rate limiting
  - Error handling
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# 16. Non-Functional Modules

## Performance

- Fast student rendering
- Low-latency autosave

## Scalability

- Stateless services
- Horizontal scaling

## Security

- HTTPS enforced
  - Secure token handling
  - GDPR-compliant deletion
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## **17. Implementation Order (Recommended)**

1. Auth + Workspace
  2. Worksheet Builder
  3. Field System
  4. Student Runner + Responses
  5. Workbook Flow
  6. Analytics
  7. Domains & Branding
  8. Super Admin
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## **18. Guiding Principle**

**Every module must support learning as an ongoing process, not a one-time submission.**