

# Integration Hub

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## Overview

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Integration Hub is a full-stack SaaS web application offering intelligent data integration through automated field mapping and transformation logic generation. It includes a marketing website and a 6-step integration workflow with a four-tier subscription model (free, one-time, monthly, annual). Users create an account with username/password authentication, then can upload data, receive smart mapping suggestions, generate XSLT and DataWeave transformations, validate results, and download production-ready code. The platform is designed for commercial B2B launch, featuring Stripe payment integration, comprehensive SEO, and free-to-paid conversion optimization.

## User Preferences

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Preferred communication style: Simple, everyday language.

## System Architecture

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### Frontend

- **Framework:** React 18 with TypeScript (SPA)
- **Routing:** Wouter for client-side routing
- **UI Components:** shadcn/ui (Radix UI primitives)
- **Styling:** Tailwind CSS with CSS variables
- **State Management:** TanStack Query for server state, React Context for subscription
- **Build System:** Vite
- **SEO:** Complete meta tags, Open Graph, Twitter Cards

### Backend

- **Runtime:** Node.js with Express.js
- **Language:** TypeScript with ES modules
- **API Design:** RESTful
- **File Processing:** Multer for multipart file uploads (CSV, JSON, XML, Excel)

### Data Storage

- **Database:** PostgreSQL with Drizzle ORM (Neon Database serverless instance)
- **Schema Management:** Drizzle Kit for migrations
- **Session Storage:** PostgreSQL-based using connect-pg-simple
- **File Storage:** Local file system

### Database Schema

- **Core Entities:** Integration Projects, Uploaded Files, Field Mappings, XSLT Validation
- **Schema Versioning:** JSON-based schema storage

### Smart Mapping and Processing

- **Intelligent Mapping:** OpenAI GPT-4 integration for field mapping suggestions

- **File Analysis:** Automated schema detection across multiple formats
- **Transformation Output:** Generates both XSLT and DataWeave code
- **XSLT Validation:** Real-time XSLT transformation testing and validation
- **Confidence Scoring:** Automated scores for mapping quality
- **Transformation Logic:** Automated generation of data transformation code
- **Validation Preview:** Displays transformed data rows (trial limitations apply)

## Authentication and Authorization

- **Authentication Provider:** Traditional username/password authentication using Passport.js local strategy
- **Password Security:** Scrypt hashing with salt for secure credential storage
- **Session Management:** Passport.js with Express-session and PostgreSQL store (connect-pg-simple)
- **Session Persistence:** PostgreSQL-backed sessions with 7-day TTL, survives server restarts
- **User Database:** Users table with subscription status (free/one-time/monthly/annual), tier, and admin role
- **Protected Routes:** Middleware for authentication ( `isAuthenticated` ), subscription ( `requirePaidSubscription` ), and admin access ( `requireAdmin` )
- **Admin System:** Admin dashboard at `/admin` for user and subscription management; `isAdmin` flag for role-based access
- **Security:** Whitelisted registration fields prevent privilege escalation; password never sent to client

## External Dependencies

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### Core Framework

- **React Ecosystem:** React 18, React DOM, React Hook Form (Zod validation)
- **Backend Framework:** Express.js (tsx runtime)
- **Database:** Drizzle ORM (PostgreSQL dialect, Neon Database driver)

### AI and Data Processing

- **OpenAI Integration:** OpenAI API client (GPT-4)
- **File Processing Libraries:** PapaParse (CSV), XLSX (Excel), fast-xml-parser (XML)
- **Data Validation:** Zod

### UI and Styling

- **Component Library:** shadcn/ui (Radix UI)
- **Styling:** Tailwind CSS, PostCSS
- **Icons:** Lucide React

### Development and Build Tools

- **Build System:** Vite
- **Runtime:** esbuild (TypeScript compilation)
- **Type Checking:** TypeScript compiler

### External Services

- **Database Hosting:** Neon Database (PostgreSQL)
- **AI Services:** OpenAI API

- **Payment Processing:** Stripe (SDK integrated)
- **File Upload:** Multer (local storage)
- **XSLT Processing:** xmldom, xslt-processor

## Commercial Features

- **Pricing Plans:** Four-tier subscription model (free, one-time, monthly, annual)
- **Payment Integration:** Stripe SDK
- **Freemium Model:** Free tier with limited features (3 projects, 5 row preview, 14-day retention)
- **Subscription Tiers:**
  - Free: \$0/once - Limited features, 3 projects (one-time per user)
  - One-Time: \$49 - 10 projects, 60-day retention
  - Monthly: \$99/month - Unlimited projects and features
  - Annual: \$999/year - Everything in Monthly + 2 months free
- **Marketing Pages:** Homepage, Blog, Pricing pages
- **SEO Optimization:** Comprehensive meta tags, Open Graph, Twitter Cards