

- Backend Logic: This entire tab is populated by [DATA DRAW] from a *separate* database table that holds scraped web data. This is not the firm's internal data.
- [AI ANALYSIS]: This data is collected by the AI Agents (configured in the "AI Agent Management" link). These agents run on a schedule, scrape public sites like LinkedIn for job postings and employee changes, and populate the competitor database.
- The AI Insights tab is a further AI analysis *on top of* this scraped data (e.g., "Competitor A is hiring 10 engineers in a new city, suggesting market expansion.").
- Endpoint: All data is displayed on the current page in the various tabs.
- [LINK] View Link (on Live Jobs)
 - Action/Workflow: This is a simple external link. The href is the URL to the LinkedIn job posting that the AI agent scraped.
 - Endpoint: Opens a new browser tab to an external website (LinkedIn).

Finance & Accounting: System Architecture (Text-Based Diagram)

This diagram outlines the module's structure and its deep, data-driven connections to other modules.

/Finance

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| -- 1. Main Finance Dashboard (/finance)

| | -- [Component] Header

| | | -- [Link] "AI Agent Management" (Platform-Wide) -> /system/agents

| | | -- [Link] "AI Chatbot" (Platform-Wide) -> Opens Chat Modal

| | | -- [Link] "Analyze Performance" -> POST /api/finance/analyze -> Navigates to /finance/analysis

| | | -- [Filter] "Business Unit" Dropdown -> Applies BU filter to all page data

| |

| | -- [Component] AI Search Box -> POST /api/ai/financial-query

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| | -- [Component] KPI Dashboard (4-Box)

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| | |-- "YTD Net Revenue vs. Plan"
| | | |-- [DATA DRAW] from: [Invoices Table], [Procurement Module (Subs)],
[Budget Module]
| | |-- "Operating Income (Current Month)"
| | | |-- [DATA DRAW] from: [Timesheet Analytics], [Expenses Table], [Budget
Module]
| | |-- "Bookings YTD"
| | | |-- [DATA DRAW] from: [Contract Management Module], [Project
Management Module]
| | |-- "Backlog"
| | | |-- [DATA DRAW] from: [Contract Module], [Invoices Table]
| | |-- [Action] "Add Dashboard Boxes" (User Customization)
| |
| |-- [Component] AI-Enhanced Income Statement
| | |-- [AI ANALYSIS] NLP Summary of the table below
| | |-- [Table] Income Statement (YTD, Current Month)
| |
| |-- [Component] YTD Performance by Business Unit Chart
| | |-- [DATA DRAW] from: [Project Module], [Timesheet Analytics]
| |
| |-- [Component] Detailed Income Statement (by Month)
| |
| |-- [Component] Overhead Spend by Account Group (Customizable)
| | |-- [DATA DRAW] from: [Procurement Module], [Timesheet Analytics (Indirect)]
| |
| |-- [Component] YTD Bookings vs. Total Plan (Chart)
| | |-- [DATA DRAW] from: [Contract Module], [Budget Module]
| |
| |-- [Component] Top Clients by DRO (Chart)
| | |-- [DATA DRAW] from: [Invoices Table], [Account Management Module]

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| |-- [Component] Firmwide Receivables (DRO, DBO, DUO)
| | |-- [DATA DRAW] from: [Invoices Table], [Timesheet Analytics (Unbilled)]
| |
| |-- [Component] AI Powered Budgeting Suite
| | |-- [Link] "Open AI Budgeting" -> Navigates to /finance/budgeting
| |
| |-- [Component] Year-Over-Year Financial Growth Table
|
|-- 2. AI Budgeting Suite Sub-Module (/finance/budgeting)
| |-- [Tab] 1: Annual Budget
| | |-- [Link] "Review Previous Years Budget"
| |-- [Tab] 2: Revenue/Expense
| | |-- [DATA DRAW] from: [Resource Management (Staffing Plans)]
| |-- [Tab] 3: BU Allocation
| |-- [Tab] 4: Variance (Alerts)
| | |-- [CRON JOB] Backend process for automated alerts
| |-- [Tab] 5: Forecasting
| | |-- [AI ANALYSIS] Runs selected forecasting models
| |-- [Tab] 6: Dashboard (Integrations)
| | |-- [API ACTION] Connects to external Accounting/Payroll systems
| |-- [Tab] 7: Scenarios
| | |-- [AI ANALYSIS] Scenario modeling
| | |-- [DATA PUSH] to: [KPIs & Performance Module (Bonus Structure)]
| |-- [Tab] 8: Approval (Workflow)
| |-- [Link] (All Tabs) "Save Budget" -> PATCH /api/budget/{id}

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Detailed Interface and Workflow Breakdown

1.0 Main Finance Dashboard (/finance)

This is the high-level, real-time command center for the firm's financial health. Access is restricted to users with appropriate financial/executive roles.

1.1 Header Links & Controls

- [LINK] **AI Agent Management**
 - Action/Workflow: Same as other modules. Navigates to the platform-wide /system/agents page, where a user can create agents.
 - Example Use Case: An admin could create an agent with the prompt, "Every Monday at 8 AM, check if any client's DRO is over 90 days and send me an alert."
- [LINK] **AI Chatbot**
 - Action/Workflow: Opens the platform-wide chatbot modal. In this module, the chatbot's context is set to the financial database.
 - [AI ANALYSIS]: A user can ask, "What was our operating income last month?" or "Show me the top 5 overhead expenses YTD." The AI uses RAG (Retrieval-Augmented Generation) to query the financial tables and provide a natural language answer.
- [LINK] **Analyze Performance**
 - Action/Workflow: On click, the user initiates a deep AI analysis of the entire dashboard.
 - Backend Logic: Triggers a POST /api/finance/analyze request. The backend sends all the data currently displayed on the dashboard (YTD vs. Plan, BU performance, etc.) to the AI model. The AI runs anomaly detection, trend analysis, and root cause analysis.
 - Endpoint: Navigates the user to a new page (/finance/analysis) which displays the AI's findings (e.g., "Critical Issue: Operating Income is 15% below plan, primarily driven by a 40% cost overrun in the 'Offshore O/H' and 'Consultants' categories.").
- [FILTER] **Business Unit Dropdown**
 - Action/Workflow: User selects a specific Business Unit (BU) or "Firmwide."
 - Backend Logic: The page reloads with a query parameter (e.g., ?bu_id=123). Every single data widget on the page re-fetches its data, filtered by this bu_id.

1.2 AI Search & KPI Dashboard

- [COMPONENT] **AI Search Box**

- Action/Workflow: This is a more direct, on-page version of the chatbot. The user types a query.
- Backend Logic: `POST /api/ai/financial-query`. The AI model translates the natural language query into a database query, executes it, and returns the result (as a number, table, or chart) directly below the search box.
- [COMPONENT] **KPI Dashboard (4-Box)**
 - Element: **YTD Net Revenue vs. Plan**
 - [DATA DRAW]: `Actual = SUM(Invoices[amount])` where `status` is 'approved' or 'paid' minus `SUM(Vendor_Bills[amount])` where `category` is 'subconsultant'. This data is drawn from the platform's internal `Invoices` and `Procurement` tables, or synced via API from an external system (e.g., QuickBooks) defined in the AI Budgeting Suite > Dashboard tab. `Plan = SUM(Budget[plan_revenue])` for the YTD period.
 - Element: **Operating Income (Current Month)**
 - [DATA DRAW]: `(Net Revenue) - (Direct Labor) - (Overhead)`. `Direct Labor = SUM(TimeEntries[hours] * Users[cost_rate])` where `is_billable = true`. `Overhead = SUM(TimeEntries[hours] * Users[cost_rate])` where `is_billable = false`, plus `SUM(Expenses[amount])` from the Procurement Module.
 - Element: **Bookings YTD**
 - [DATA DRAW]: This is a critical multi-module draw. `Bookings = SUM(Contracts[value])` from the Contract Management Module where `status` is 'executed' in the current year, PLUS `SUM(Projects[task_order_value])` from the Project Management Module for new tasks booked in the current year.
 - Element: **Backlog**
 - [DATA DRAW]: `SUM(Contracts[value])` for all *active* contracts MINUS `SUM(Invoices[amount_billed])` for those same contracts. This provides the total remaining value to be earned.
 - Element: **[Action] Add Dashboard Boxes**
 - Backend Logic: The user can customize their dashboard. The backend must store these preferences in a `UserPreferences` table.

1.3 Income Statements & Charts

- [COMPONENT] **AI-Enhanced Income Statement**

- Backend Logic: The table is a standard financial report. The [AI ANALYSIS] summary is generated by sending the table's JSON data to an NLP model with a prompt like, "Summarize the key takeaways from this financial statement in one sentence."
- [COMPONENT] Overhead Spend by Account Group
 - Backend Logic: [DATA DRAW] from the Expenses table in the Procurement Module and indirect hours from Timesheet Analytics. The user's request to "add or delete items" means the Account Group list must be a customizable lookup table in the Admin settings, not hard-coded.

1.4 Receivables & AI Budgeting Suite

- [COMPONENT] Top Clients by DRO (Chart)
 - Backend Logic: [DATA DRAW] from the Invoices table. The backend calculates $DRO = (Avg\ Accounts\ Receivable / Total\ Credit\ Sales) * 30$ for each client and sorts descending. This DRO metric is a key [DATA PUSH] to the Account Management Module, where it heavily influences a client's "AI Health Score."
- [COMPONENT] Firmwide Receivables (DRO, DBO, DUO)
 - Backend Logic: DRO (Days Receivable Outstanding) and DBO (Days Billed Outstanding) are drawn from the Invoices table. DUO (Days Unbilled Outstanding) is drawn from TimeEntries table, calculating the value of billable work that has not yet been invoiced.
- [LINK] Open AI Budgeting
 - Action/Workflow: On click, navigates the user to the /finance/budgeting sub-module.
 - Endpoint: The 8-tab Budgeting Suite page.

2.0 AI Budgeting Suite Sub-Module (/finance/budgeting)

This is a full-page "app-within-an-app" for creating the firm's financial plan, which is the "Plan" against which all "Actuals" are measured.

- [Tab 1] Annual Budget
 - [LINK] Review Previous Years Budget: Navigates to a new page (/finance/budgeting/historical). This page [DATA DRAW] Budget records from the last 3 years. The "Copy" action duplicates a past budget record as a new "draft" for the current year.

- [LINK] **Import Data: POST /api/budget/import**. Backend parses the Excel/PDF and populates the budget fields.
- [Tab 2] **Revenue/Expense**
 - Backend Logic: The **Revenue Targets** section has a critical **[DATA DRAW]** link. The user can click "Import from Staffing Plans." This triggers an API call that **[DATA DRAW] SUM(forecasted_revenue)** from all plans in the Resource Management Module's Staffing Plan sub-module. This is a key autonomous feature that aligns sales projections with resource planning.
- [Tab 4] **Variance**
 - Backend Logic: This tab saves alerting preferences (**[DATA PUSH]**). A **Cron Job** (scheduled task) runs based on the **variance_report_frequency**. This job **[DATA DRAW] Actuals vs. Plan**, and if **variance_alert_percent** is exceeded, it triggers an email notification.
- [Tab 5] **Forecasting**
 - Backend Logic: This is an **[AI ANALYSIS]** feature. The user selects a model. The backend **[DATA DRAW]** historical data, runs it through the selected model (e.g., ARIMA), and saves the resulting projection.
- [Tab 6] **Dashboard**
 - Backend Logic: This is the integration hub. It stores and manages API keys/OAuth tokens for external systems (QuickBooks, ADP, etc.). The **[Action] Sync Now** button triggers an immediate data pull from that external API.
- [Tab 7] **Scenarios**
 - Backend Logic: A powerful **[AI ANALYSIS]** modeling tool. The user inputs base assumptions, and the AI projects 3 scenarios.
 - **[DATA PUSH]**: The **Bonus Structure** data saved here is the *source* data. The KPIs & Performance Module will **[DATA DRAW]** from this table (**GET /api/budget/bonus-structure**) to calculate bonus payouts in its "Bonuses" tab. This is a critical connection.
- [Tab 8] **Approval**
 - Backend Logic: A simple workflow engine. Submitting the budget changes its **status** to 'Pending Approval' and notifies the executive team.