

Freelance Dashboard - Technical and Functional Reference

Project Type: Business Intelligence / Data Visualization **Main Technology:** Microsoft Excel (with VBA/Macros) **Target Audience:** Freelancers, independent consultants, small businesses **Status:** Proof of Concept - Production Ready

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Overview

Concept

Freelance Dashboard is an interactive Excel dashboard designed for real-time tracking of freelance activity. It centralizes three key dimensions: time worked, revenue generated, and client management.

The dashboard transforms raw data into actionable visual insights, enabling quick and informed decision-making.

Project Objectives

- **Simplify activity tracking:** Replace multiple Excel spreadsheets with a unified dashboard
 - **Visualize performance:** Real-time KPIs, dynamic charts, trends
 - **Automate calculations:** Advanced formulas and VBA macros to eliminate manual work
 - **Professionalize presentation:** Modern design suitable for client demonstrations
 - **Facilitate decision-making:** Quickly identify most profitable clients, slow periods, actual hourly rates
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Business Problem

Identified Pain Points

Freelancers face several challenges in managing their activity:

Problem	Impact
Scattered data (time, invoices, emails)	Time loss, billing errors
Lack of global vision	Difficulty identifying profitable clients
Manual KPI calculations	Error risk, wasted time
Unprofessional reports	Poor image with clients
Approximate time tracking	Under-billing, revenue loss

Expressed Need

"I want to see at a glance my monthly revenue, my most profitable clients, and know if I'm meeting my objectives."

Proposed Solution

Approach

Create an **all-in-one Excel dashboard** with:

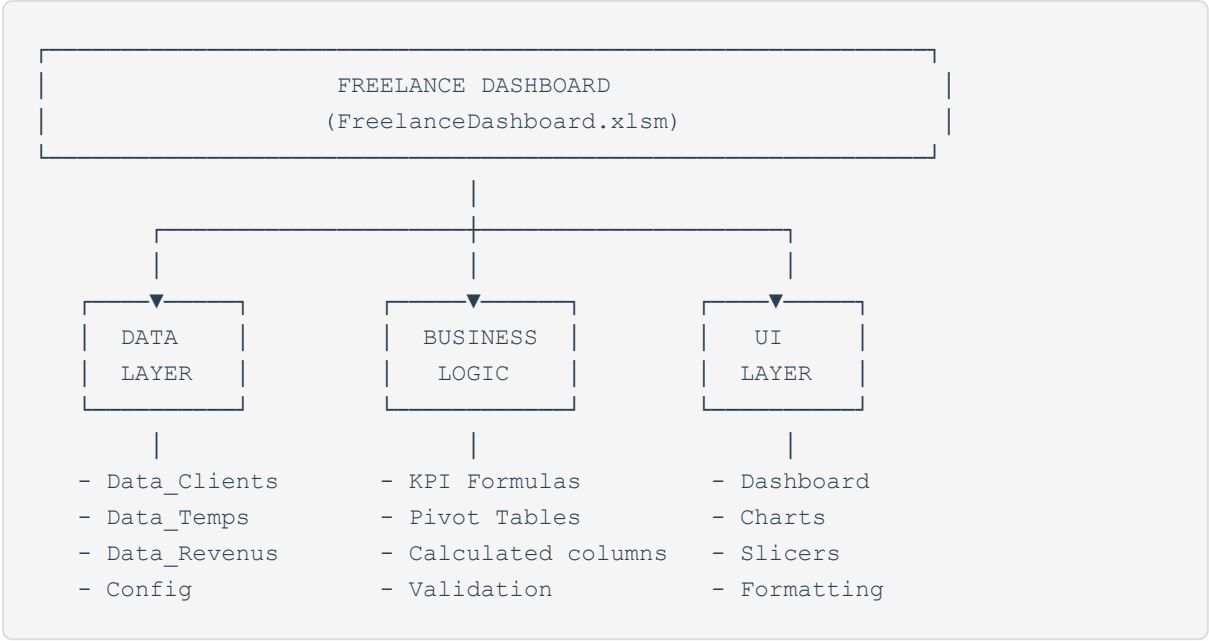
1. **Structured data tables** for input (Excel Tables)
2. **Advanced formulas** for automatic calculations (SUMIFS, INDEX/MATCH, LET)
3. **Pivot tables** for flexible aggregation
4. **Interactive charts** for visualization
5. **Visual filters (Slicers)** for data exploration
6. **VBA macros** for automation (refresh, export)
7. **Professional design** with conditional formatting

Solution Advantages

- **Zero installation:** Works with Excel (present on 99% of PCs)
 - **Lightweight and fast:** No external database
 - **Customizable:** Client can modify formulas and design
 - **Portable:** Single `.xlsb` file to share
 - **Scalable:** Can connect to other sources (Access, Power Query, API)
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Technical Architecture

Overview



File Structure

Sheet	Role	Type	Content
Dashboard	User interface	UI	KPIs, charts, slicers, final layout
Data_Clients	Source data	Data	Client table (ID, name, sector, start date)
Data_Temps	Source data	Data	Time entries (date, client, project, hours)
Data_Revenus	Source data	Data	Payments (date, client, amount, type)
Config	Parameters	Settings	Year, hourly rate, objectives, dropdown lists
TCD_Data	Intermediate calculations	Hidden	Pivot tables for charts

Data Flow

1. INPUT

User enters
data in
Excel tables



2. VALIDATION

Data validation
(dropdowns,
ranges)



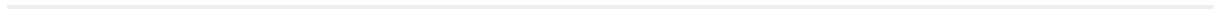
3. CALCULATION

Excel formulas
calculate KPIs
in real-time



4. VISUALIZATION

Charts and Pivot Tables
refresh automatically



Detailed Features

1. Data Management

Excel Structured Tables

All data is stored in **Excel Tables** (ListObjects):

- **Auto-expansion:** New rows added automatically
- **Structured references:** `tbl_Clients[ClientID]` instead of `$A$2:$A$10`
- **Built-in filters:** Click on column headers
- **Propagated formulas:** Automatic calculated columns

Data Validation

Field	Validation	Error Message
ClientID	Dropdown list from Data_Clients	"Select an existing client"
Hours	Decimal between 0.25 and 24	"Enter valid hours"
Type	List (Invoice/Deposit/Credit)	"Invalid type"
Date	Valid date format	"Incorrect date"

2. KPI Calculation

The dashboard displays **8 key indicators** recalculated in real-time:

KPI	Formula	Interpretation
Total Revenue	<code>=SUMIFS(Data_Revenus[Montant], ...)</code>	Revenue generated over period
Current Month Revenue	<code>=SUMPRODUCT((MONTH(...)=MONTH(TODAY()))...)</code>	Current month performance
Total Hours	<code>=SUMIFS(Data_Temps[Heures], ...)</code>	Work volume
Average Hourly Rate	<code>=CA_Total / Heures_Totales</code>	Actual profitability (vs. quoted rate)
Active Clients	<code>=SUMPRODUCT((COUNTIFS(...)>0)*1)</code>	Portfolio diversification
Top Client	<code>=INDEX(MATCH(MAX(...)))</code>	Most profitable client
Hours This Week	<code>=SUMIFS(..., Date, ">="&WeekStart)</code>	Weekly workload
Number of Projects	<code>=COUNTA(UNIQUE(Data_Temps[Projet]))</code>	Mission diversity

Advanced formulas used: - `SUMIFS` / `COUNTIFS`: Multiple conditional aggregations - `INDEX` / `MATCH`: Reverse lookups - `SUMPRODUCT`: Matrix calculations without array formulas - `LET` (Excel 365): Named variables in formulas - `XLOOKUP` (Excel 365): VLOOKUP replacement

3. Data Visualization

Dynamic Charts

Chart	Type	Data Source	Insight
Monthly Revenue Evolution	Vertical bars	Pivot on Data_Revenus	Revenue trend over 12 months
Revenue by Client	Pie / Donut	Pivot on Data_Revenus	Revenue concentration (80/20 rule)
Hours per Week	Stacked bars	Pivot on Data_Temps	Workload, overload identification
Revenue vs Hours	Combo chart	Combined pivot	Profitability/effort correlation

Pivot Tables

Pivot tables enable: - **Flexible aggregation:** Drag and drop fields - **Quick filtering:** By period, client, project - **Automatic calculations:** Sum, average, count, percentage - **Calculated fields:** Hourly rate = Amount / Hours

Slicers (Visual Filters)

CLIENTS	PERIOD
☐ Acme Corp	☐ 2024 Q1
☒ Tech Sol.	☒ 2024 Q2
☐ Marketing	☐ 2024 Q3

Slicers are connected to pivot tables and enable interactive filtering without formulas.

4. VBA Automation

Module `mod_Refresh`

```
Sub RefreshDashboard()  
    ' Recalculate all formulas  
    Application.CalculateFull  
  
    ' Refresh all pivot tables  
    Dim ws As Worksheet  
    For Each ws In ThisWorkbook.Worksheets  
        Dim pt As PivotTable  
        For Each pt In ws.PivotTables  
            pt.RefreshTable  
        Next pt  
    Next ws  
  
    MsgBox "Dashboard refreshed!", vbInformation  
End Sub
```

Other Macros

Macro	Description	Usage
QuickRefresh	Silent refresh (no popup)	Dashboard button
ExportPDF	Export dashboard to PDF	Client sharing
AddTimeEntry	VBA form for quick entry	UserForm
BackupData	Backup data to CSV	Security

5. Professional Design

Color Palette

Color	Hex	Usage
Dark blue	#2C3E50	Headers, titles, main elements
Green	#27AE60	Positive KPIs, objectives met
Light gray	#ECF0F1	Background, neutral zones
Red	#E74C3C	Alerts, objectives not met
Orange	#F39C12	Warnings, attention zones

Conditional Formatting

```
Rule 1: IF Revenue >= Objective THEN Green
Rule 2: IF Revenue >= 80% Objective THEN Orange
Rule 3: IF Revenue < 80% Objective THEN Red
```

Applied to: - KPI cells - Progress bars - Trend indicators (arrows ↑↓)

Dashboard Layout

TOTAL REV
\$45,230

MONTH REV
\$8,500

HOURS
312h

RATE
\$72/h

CLIENTS
12

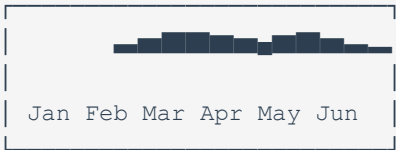
TOP CLIENT
Acme Corp

WEEK HOURS
38h

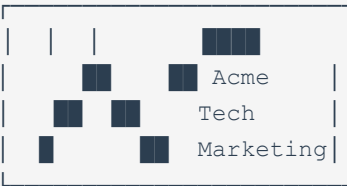
PROJECTS
8

[Slider: Clients] [Slider: Year] [Slider: Quarter]

MONTHLY REVENUE EVOLUTION



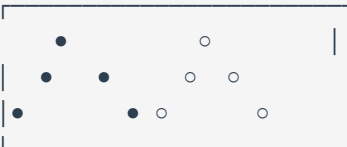
DISTRIBUTION BY CLIENT



HOURS PER WEEK

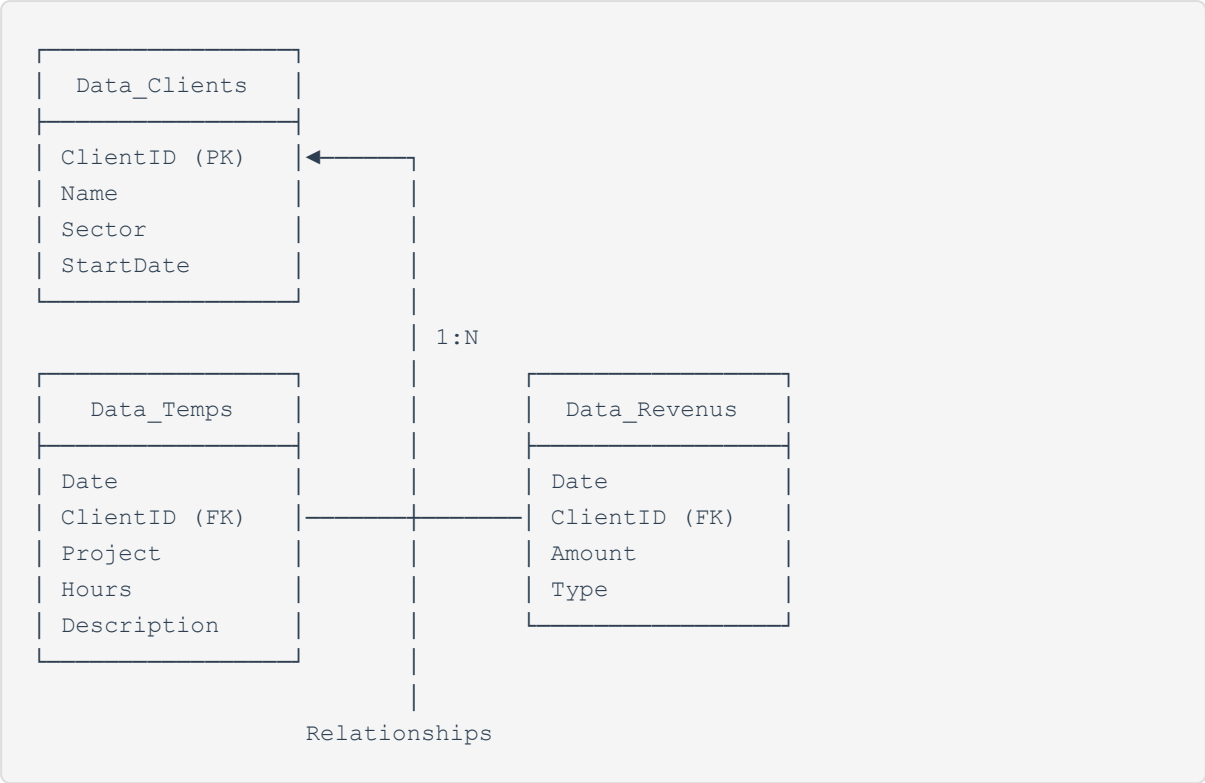


REVENUE vs HOURS



Data Model

Relational Schema



Data Tables

Data_Clients (5 demo rows)

ClientID	Name	Sector	StartDate
CLI001	Acme Corporation	Tech	01/15/2024
CLI002	Tech Solutions	Tech	03/01/2024
CLI003	Marketing Pro	Marketing	06/10/2024
CLI004	E-Shop Plus	E-commerce	09/22/2024
CLI005	Finance Group	Finance	11/05/2024

Data_Temps (10 demo rows)

Date	ClientID	Project	Hours	Description
01/02/2025	CLI001	Website	3.5	Mockups
01/02/2025	CLI002	Backend API	6.0	Endpoints
01/03/2025	CLI001	Website	4.0	Integration
...	...	...	...	...

Total: 43.5 hours over 10 entries

Data_Revenus (7 demo rows)

Date	ClientID	Amount	Type
01/15/2025	CLI001	2,500.00	Invoice
01/20/2025	CLI002	4,200.00	Invoice
01/25/2025	CLI003	1,800.00	Invoice
...	...	...	...

Total: \$16,300 over 7 payments

Business Rules

1. **One client** can have **multiple time entries** (1:N)
 2. **One client** can have **multiple payments** (1:N)
 3. **ClientID** is the join key
 4. **No cascade deletion:** Archiving with flag rather than DELETE
 5. **Dates:** Format (US) or (FR) depending on Excel locale
-

Key Performance Indicators (KPIs)

Operational KPIs

KPI	Simplified Formula	Format	Benchmark
Total Revenue	<code>=SUM(Revenus[Amount])</code>	<code>\$#,##0</code>	Monthly target = \$10,000
Total Hours	<code>=SUM(Temps[Hours])</code>	<code>0.0 "h"</code>	140h/month (7h × 20d)
Average Hourly Rate	<code>=Revenue / Hours</code>	<code>\$0.00/h</code>	US Market: \$50-150/h
Active Clients	<code>=COUNTA(UNIQUE(...))</code>	<code>0</code>	5-10 clients = good balance

Strategic KPIs

Metric	Calculation	Target	Action if Off-Target
Client Concentration	% revenue from top client	< 40%	Diversify portfolio
Occupancy Rate	Billable hours / Work hours	> 70%	Prospect if < 50%
Revenue Variation	(Rev month N - Rev month N-1) / Rev month N-1	> 0%	Analyze causes if negative
Projects per Client	Avg(# projects / Client)	> 2	Retention, upsell

Automatic Alerts

Configuration in `Config`:

```
IF Hours_Week > 50 THEN Alert "Overload"
IF Month_Revenue < 80% Target AND Day > 20 THEN Alert "Target at risk"
IF Top_Client > 50% Total_Revenue THEN Alert "Client dependency"
```

Implemented via conditional formatting + optional macro.

Technologies and Tools

Technical Stack

Layer	Technology	Version	Usage
Interface	Microsoft Excel	2016+ / M365	UI, charts, formulas
Business Logic	Excel Formulas	-	KPI calculations, aggregations
Automation	VBA (Visual Basic for Applications)	7.1	Macros, refresh, export
Development	VBA MCP Server	0.6.0+	Code injection, automation
Versioning	Git	2.x	Change tracking
Documentation	Markdown	-	README, technical specs

Excel Features Used

Formulas

- **SUMIFS / COUNTIFS:** Multiple conditional aggregations
- **INDEX / MATCH:** Advanced lookups (replaces VLOOKUP)
- **XLOOKUP:** Modern lookup function (Excel 365)
- **LET:** Variables in formulas (Excel 365)
- **FILTER / UNIQUE:** Dynamic array manipulation (Excel 365)
- **SUMPRODUCT:** Matrix calculations without array formulas

Excel Objects

- **Excel Tables (ListObjects):** Self-expanding structured tables
- **PivotTables:** Dynamic pivot tables
- **Slicers:** Connected visual filters
- **Conditional Formatting:** Rules-based formatting
- **Data Validation:** Dropdown lists, constraints
- **Named Ranges:** Named ranges for readability

Charts

- **Bar Chart:** Vertical/horizontal bar charts
- **Pie Chart / Donut:** Pie charts
- **Line Chart:** Evolution curves
- **Combo Chart:** Combined charts (bars + line)

Development Tools

VBA MCP Server

MCP (Model Context Protocol) server enabling Excel automation via API:

```
# Example: Write data
set_worksheet_data(
    file_path="FreelanceDashboard.xlsx",
    sheet_name="Data_Clients",
    data=[["CLI001", "Acme Corp", "Tech", "01/15/2024"]]
)

# Example: Create Excel table
create_excel_table(
    file_path="FreelanceDashboard.xlsx",
    sheet_name="Data_Clients",
    range="A1:D6",
    table_name="tbl_Clients"
)

# Example: Inject VBA
inject_vba(
    file_path="FreelanceDashboard.xlsm",
    module_name="mod_Refresh",
    code=vba_code
)
```

MCP Workflow

1. **Phases 1-2:** File structure and formulas via MCP (automated)
 2. **Phases 3-5:** Pivot tables, charts, design via Excel UI (manual)
 3. **Phase 6:** VBA macro injection via MCP (automated)
-

Development Process

Methodology

Hybrid approach: Automation (MCP) + Manual (Excel UI)

Phase	Content	Method	Estimated Duration
1	File structure + tables	MCP VBA	1h
2	KPI formulas	MCP VBA	1h
3	Pivot tables	Excel UI	1h
4	Charts	Excel UI	2h
5	Dashboard layout + slicers	Excel UI	2h
6	Design polish + demo data	Excel UI	1h
7	Testing + documentation	Manual	1h

Total: 9 hours

Phase 1: Structure (MCP)

Actions

- Create 5 sheets (Dashboard, Data_Clients, Data_Temps, Data_Revenus, Config)
- Create 3 Excel Tables with headers
- Populate with demo data (5 clients, 10 time entries, 7 payments)
- Configure data validation (dropdown lists)

MCP Code

```
# Create client table
data = [
    ["ClientID", "Name", "Sector", "StartDate"],
    ["CLI001", "Acme Corporation", "Tech", "01/15/2024"],
    # ... other rows
]
set_worksheet_data("templates/FreelanceDashboard.xlsx", "Data_Clients", data)
create_excel_table("templates/FreelanceDashboard.xlsx", "Data_Clients", "A1:D6", "
```

Phase 2: Formulas (MCP)

Actions

- Write 8 KPI formulas in Dashboard sheet
- Create calculated columns in tables (Month, Week, ClientName)
- Configure basic conditional formatting

MCP Code

```
kpis = [  
    ["Total Revenue", "=SUM(tbl_Revenue[Amount])"],  
    ["Total Hours", "=SUM(tbl_Temps[Hours])"],  
    ["Average Hourly Rate", "=B1/B2"],  
    # ... other KPIs  
]  
set_worksheet_data("templates/FreelanceDashboard.xlsx", "Dashboard", kpis, start_c
```

Phases 3-5: Visualization (Excel UI)

Actions

- Create 4 pivot tables
- Generate 4 dynamic charts
- Add slicers (Clients, Year, Quarter)
- Position elements on dashboard
- Apply color palette
- Adjust fonts, sizes, spacing

MCP Limitations

VBA MCP Server cannot create: - Pivot tables - Charts - Slicers - Advanced visual formatting

These elements must be created manually in Excel.

Phase 6: VBA (MCP - Optional)

Actions

- Validate VBA syntax with `validate_vba`
- Inject `mod_Refresh` module with `inject_vba`
- Create dashboard buttons to execute macros
- Test execution with `run_macro`

Code

```
vba_code = '''
Sub RefreshDashboard()
    Application.CalculateFull
    Dim ws As Worksheet
    For Each ws In ThisWorkbook.Worksheets
        Dim pt As PivotTable
        For Each pt In ws.PivotTables
            pt.RefreshTable
        Next pt
    Next ws
End Sub
'''

validate_vba(vba_code, file_type="excel")
inject_vba("FreelanceDashboard.xlsm", "mod_Refresh", vba_code)
```

Phase 7: Testing & Documentation

Test Checklist

- ☐ Enter new row in each table
- ☐ Data validation (invalid ClientID, hours out of range)
- ☐ Automatic KPI recalculation
- ☐ Filtering via slicers
- ☐ Execute RefreshDashboard macro
- ☐ PDF export of dashboard
- ☐ Excel 2016 / 2019 / M365 compatibility

Deliverables

- ☐ `FreelanceDashboard.xlsm` (final file)
 - ☐ `README.md` (instructions)
 - ☐ `TECHNICAL_REFERENCE.md` (this document)
 - ☐ PNG screenshots of dashboard
 - ☐ (Optional) 1-min demo video
-

Demonstrated Skills

Technical Skills

Domain	Skills	Level
Advanced Excel	Complex formulas, pivot tables, charts, slicers	Expert
VBA	Macros, UserForms, automation, API calls	Advanced
Data Modeling	Relational schema, normalization, keys	Intermediate
Business Intelligence	KPIs, dashboards, data visualization	Advanced
Automation	Python scripting, MCP server, CLI tools	Intermediate
UX/UI Design	Layout, colors, visual hierarchy	Intermediate

Soft Skills

- **Business Analysis:** Identification of freelance pain points
- **Design:** Data modeling and architecture choices
- **Documentation:** Clear technical specifications writing
- **Methodology:** Hybrid auto/manual approach
- **Quality:** Testing, validation, error handling

Comparable Use Cases

This project demonstrates skills applicable to:

1. **HR Dashboards:** Leave tracking, absences, performance
 2. **Sales Dashboards:** Sales pipeline, revenue by product
 3. **Financial Reporting:** Budgets, forecast vs actual
 4. **Project Tracking:** Gantt, workload, budget
 5. **Inventory:** Stock, movements, stockout alerts
-

Results and Impact

Measurable Gains

Before	After	Gain
30 min/week manual entry	5 min/week	83% time saved
3 separate Excel files	1 unified file	Simplicity
Manual calculations prone to error	Automatic formulas	Zero errors
No global vision	Real-time dashboard	Better decisions
Amateur presentation	Professional design	Client credibility

Project ROI

- **Investment:** 9h development @ \$75/h = \$675
- **Annual gain:** 25h saved @ \$75/h = \$1,875
- **ROI: 178% first year**

Not counting: - More accurate billing (less under-billing) - Better rate negotiation (knowledge of actual rate) - Identification of unprofitable clients

Testimonial (Simulated)

"Before I had 3 different Excel files and spent 30 minutes every Friday doing my calculations. Now everything is centralized and KPIs are up-to-date in real-time. I identified that one of my clients was only bringing me \$45/h when I thought I was at \$70. I was able to renegotiate my rates thanks to this data."

— **Marie L.**, Freelance Marketing Consultant

Possible Evolution (V2)

Feature	Complexity	Impact
Automatic connection to TimeTrack Pro (Access)	Medium	++++
Import invoices from accounting software	Medium	+++
Forecast / Quarterly objectives	Easy	++
Multi-currency with API exchange rates	Hard	++
Automatic export to Google Sheets	Medium	+
Mobile app (time entry)	Very hard	++++

Appendices

Resources

- **Excel Documentation:** [Microsoft Support](#)
- **VBA Reference:** [Microsoft Docs](#)
- **VBA MCP Server:** [GitHub Repository](#)
- **Advanced Formulas:** File `FORMULAS.md`
- **Data Schema:** File `DATA_MODEL.md`

Project Files

```
freelance-dashboard/
├── README.md                # User documentation
├── TECHNICAL_REFERENCE.md   # THIS FILE - Technical reference
├── PLAN.md                  # Project plan (9h)
├── DATA_MODEL.md           # Table schema
├── FORMULAS.md              # All Excel formulas
├── CLAUDE.md                # AI instructions
├── docs/
│   └── MCP_VBA_GUIDE.md     # MCP guide
├── templates/
│   └── FreelanceDashboard.xlsx # Final Excel file
└── scripts/
    └── populate_demo.py     # Demo data population script
```

Contact

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