

# TimeTrack Pro

## Technical & Functional Reference

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*Professional Time Tracking Application*  
*Built with Microsoft Access & VBA*  
*Automated Development via MCP VBA Server*

| Project Highlights     |                     |
|------------------------|---------------------|
| Total VBA Code         | 915 Lines           |
| Modular Components     | 7 Modules           |
| Database Tables        | 3 Normalized Tables |
| Public Functions       | 45+ Functions       |
| Development Time Saved | 45% via Automation  |
| Code Quality           | 25% Comment Ratio   |

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# 1. Executive Summary

TimeTrack Pro is a professional time tracking application built on Microsoft Access, showcasing advanced database design, VBA automation, and modern development practices. This project demonstrates the capability to deliver production-ready business applications through automated development workflows using the VBA MCP Server.

**Key Achievement:** Complete application development (database structure, business logic, queries, and VBA modules) automated via MCP (Model Context Protocol), demonstrating cutting-edge AI-assisted development.

## 1.1 Project Statistics

| Metric           | Value | Description                  |
|------------------|-------|------------------------------|
| Total VBA Lines  | 915   | Professional, commented code |
| VBA Modules      | 7     | Modular architecture         |
| Database Tables  | 3     | Normalized structure         |
| Public Functions | 45+   | Reusable components          |
| Time Saved       | 45%   | Via MCP automation           |
| Comment Ratio    | 25%   | Well-documented              |
| Error Handling   | 100%  | All public functions         |

## 1.2 Current Data

| Metric             | Value     |
|--------------------|-----------|
| Active Clients     | 4         |
| Active Projects    | 6         |
| Time Entries       | 15+       |
| Hours Tracked      | 58 hours  |
| Revenue Calculated | €4,732.50 |

## 2. Project Overview

### 2.1 Purpose

TimeTrack Pro is a time management tool designed for freelancers, consultants, and small teams to:

- Track billable hours across multiple clients and projects
- Calculate revenue automatically based on hourly rates
- Generate professional reports for invoicing
- Maintain complete audit trail of time entries

### 2.2 Target Audience

| Audience    | Use Case                                                  |
|-------------|-----------------------------------------------------------|
| Freelancers | Independent consultants tracking multiple client projects |
| Small Teams | Agencies managing client work and resource allocation     |
| Consultants | Professional services requiring detailed time records     |

### 2.3 Technology Stack

| Component       | Technology       | Version          |
|-----------------|------------------|------------------|
| Database        | Microsoft Access | 2016+/Office 365 |
| Language        | VBA              | 7.1              |
| Automation      | VBA MCP Server   | v0.6.0+          |
| Export          | PDF, Excel       | Native           |
| Version Control | Git              | 2.x              |

# 3. Database Architecture

The application uses a normalized relational database following third normal form (3NF). Three core tables with enforced referential integrity.

## 3.1 Entity Relationships

tbl\_Clients (1) ■■■■ (N) tbl\_Projets (1) ■■■■ (N) tbl\_Temps • One Client has many Projects (1:N) • One Project has many Time Entries (1:N) • Referential integrity enforced with CASCADE

## 3.2 Table: tbl\_Clients

| Field        | Type       | Constraints   | Description             |
|--------------|------------|---------------|-------------------------|
| ClientID     | AutoNumber | PRIMARY KEY   | Unique identifier       |
| Nom          | Text(100)  | NOT NULL      | Client name             |
| Email        | Text(100)  | VALIDATED     | Email with format check |
| Telephone    | Text(20)   | NULL          | Phone number            |
| Notes        | Memo       | NULL          | Additional notes        |
| DateCreation | DateTime   | DEFAULT Now() | Creation timestamp      |

## 3.3 Table: tbl\_Projets

| Field        | Type       | Constraints   | Description        |
|--------------|------------|---------------|--------------------|
| ProjetID     | AutoNumber | PRIMARY KEY   | Unique identifier  |
| ClientID     | Long       | FOREIGN KEY   | Ref to tbl_Clients |
| Nom          | Text(100)  | NOT NULL      | Project name       |
| Description  | Memo       | NULL          | Project details    |
| TauxHoraire  | Currency   | DEFAULT 0     | Hourly rate (EUR)  |
| Actif        | Yes/No     | DEFAULT True  | Active/archived    |
| DateCreation | DateTime   | DEFAULT Now() | Creation timestamp |

### 3.4 Table: tbl\_Temps

| Field        | Type       | Constraints   | Description            |
|--------------|------------|---------------|------------------------|
| TempsID      | AutoNumber | PRIMARY KEY   | Unique identifier      |
| ProjetID     | Long       | FOREIGN KEY   | Ref to tbl_Projets     |
| Date         | DateTime   | NOT NULL      | Entry date (no future) |
| Duree        | Double     | NOT NULL, > 0 | Hours (decimal)        |
| Description  | Memo       | NULL          | Work description       |
| DateCreation | DateTime   | DEFAULT Now() | Creation timestamp     |

# 4. VBA Module Architecture

Modular VBA architecture with 7 core modules totaling 915 lines of professional, commented code. Clear separation of concerns following best practices.

## 4.1 Module Overview

| Module          | Purpose                       | LOC | Functions |
|-----------------|-------------------------------|-----|-----------|
| mod_Config      | App configuration & constants | 80  | —         |
| mod_Navigation  | Form navigation & UI flow     | 120 | 7         |
| mod_DataAccess  | CRUD operations & DB layer    | 200 | 15+       |
| mod_Calculs     | Business logic & calculations | 150 | 8         |
| mod_Export      | Report generation & export    | 120 | 5         |
| mod_Utils       | Helper functions & validation | 100 | 8         |
| mod_FormBuilder | Automated form creation       | 145 | 6         |

## 4.2 Code Quality Metrics

- Total VBA Lines: **915**
- Average Module Size: **~130 lines**
- Total Functions: **45+**
- Comment Ratio: **25%**
- Error Handling: **100%** (all public functions)
- Coding Standard: **Option Explicit**, meaningful names, consistent indentation

## 5. Functional Specifications

### 5.1 Core Features

| Feature                | Description                           | Status     |
|------------------------|---------------------------------------|------------|
| Client Management      | Full CRUD for clients with contacts   | ✓ Complete |
| Project Management     | Projects linked to clients with rates | ✓ Complete |
| Time Entry             | Quick entry with validation           | ✓ Complete |
| Automatic Calculations | Revenue by project/client             | ✓ Complete |
| Report Generation      | Exportable PDF/Excel reports          | ✓ Complete |
| Data Validation        | Email, phone, date validation         | ✓ Complete |

### 5.2 User Interface

| Form            | Purpose                                     |
|-----------------|---------------------------------------------|
| frm_Accueil     | Main dashboard with navigation & statistics |
| frm_Clients     | Client list with add/edit/delete            |
| frm_Projets     | Project management with client filter       |
| frm_SaisieTemps | Quick time entry (<30 sec target)           |
| frm_Historique  | Time history with filters & export          |

## 6. MCP VBA Server Automation

This project showcases advanced automation using the VBA MCP Server (Model Context Protocol), enabling AI-assisted development of Access applications. This cutting-edge approach demonstrates the future of database application development.

### 6.1 Development Efficiency

| Phase           | Estimated | Actual | Method          |
|-----------------|-----------|--------|-----------------|
| Database Design | 1h        | 0.5h   | MCP Automated   |
| Test Data       | 30min     | 15min  | MCP Automated   |
| VBA Modules     | 3h        | 1h     | MCP Automated   |
| SQL Queries     | 30min     | 20min  | MCP Automated   |
| Forms           | 2h        | 1h     | Script + Manual |
| Testing & Docs  | 2h        | 2h     | Manual          |
| TOTAL           | 9h        | ~5h    | 45% Time Saved  |

### 6.2 MCP Tools Used

- **run\_access\_query** - DDL/DML SQL execution
- **inject\_vba** - Module code injection
- **validate\_vba\_code** - Pre-injection syntax check
- **get/set\_worksheet\_data** - Bulk data operations
- **list\_access\_tables** - Schema verification
- **compile\_vba** - Compilation error detection
- **backup\_vba** - Safety backups before changes

## 7. Use Cases & Applications

### 7.1 Freelance Consultant

**Scenario:** Independent consultant managing 5 clients with 8 ongoing projects.

- Log time daily (2 min/day)
- Review weekly hours by project
- Generate monthly client reports
- Export to Excel for accounting

### 7.2 Small Design Agency

**Scenario:** 3-person team tracking time across 10 client projects.

- Team members log time per project
- Manager reviews hours weekly
- Generate client reports at milestones
- Calculate project profitability

### 7.3 IT Contractor

**Scenario:** IT professional with retainer clients and hourly projects.

- Different rates per project/client
- Track support vs project hours
- Monitor retainer budgets
- Detailed invoices with descriptions

## 8. Installation & Deployment

### 8.1 Prerequisites

- Windows 10/11
- Microsoft Access 2016+ or Office 365 with Access
- Macro security: Enable VBA macros

### 8.2 Quick Start

1. Clone/download project 2. Open db/TimeTrackPro.accdb 3. Enable macros when prompted  
4. Import forms (first time): - Alt+F11 → Import → scripts/modules/mod\_FormBuilder.bas  
- Ctrl+G → BuildAllForms → Enter 5. Start using application

### 8.3 Deployment Options

| Option         | Description                   | Best For          |
|----------------|-------------------------------|-------------------|
| Single-User    | Copy .accdb to user machine   | Personal use      |
| Split Database | Frontend + backend on network | Team (< 10 users) |
| SQL Server     | Migrate to SQL Server backend | Enterprise        |

# 9. Professional Services Available

This project demonstrates expertise in the following areas:

| Service                      | Description                                                 |
|------------------------------|-------------------------------------------------------------|
| Microsoft Access Development | Forms, reports, VBA automation, SQL optimization            |
| Database Design              | Normalization, indexing, referential integrity, performance |
| Business Applications        | Requirements, UX design, testing, deployment                |
| Process Automation           | VBA macros, MCP integration, workflow optimization          |
| Legacy Modernization         | Access to SQL Server/web migration                          |
| AI-Assisted Development      | MCP Server integration, cutting-edge automation             |

## Contact Information

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# 10. Appendices & Resources

## 10.1 Documentation Files

| File                   | Purpose                          |
|------------------------|----------------------------------|
| README.md              | Project overview and quick start |
| TECHNICAL_REFERENCE.md | Complete technical reference     |
| DATABASE.md            | Detailed database schema         |
| VBA_MODULES.md         | VBA code documentation           |
| PLAN.md                | Project development plan         |
| CHANGELOG.md           | Version history                  |
| docs/MCP_VBA_GUIDE.md  | MCP VBA usage guide              |

## 10.2 License & Usage

- **License:** MIT License
- **Commercial Use:** Permitted
- **Modification:** Permitted
- **Distribution:** Permitted
- **Private Use:** Permitted

## 10.3 Version Information

| Item                | Details          |
|---------------------|------------------|
| Document Version    | 1.0              |
| Application Version | 1.0              |
| Last Updated        | January 13, 2025 |
| Status              | Production Ready |

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*This document serves as the authoritative technical and functional reference for TimeTrack Pro.*

*For development assistance or custom modifications, contact the author.*