

## **Project Controlling Methodology & Technical Approach**

### **Data Foundation & Quality Assurance**

#### **1. Data Consolidation & Translation**

- **Challenge:** Three separate German-language hours reports with identical schema but different time periods
- **Solution:** Combined all extracts into a unified master dataset, translating column headers and key business terms while preserving original data integrity
- **Technical Implementation:** Excel-based consolidation with consistent naming conventions and data dictionary creation

#### **2. Missing Hourly Rate Imputation**

- **Challenge:** Critical cost data missing (zero or blank hourly rates) for approximately 7% of transactions
- **Solution:** Implemented tiered rate imputation system:
  1. **Client-specific averages** where historical rates existed
  2. **Person-level averages** for clients with single-resource assignments (e.g., Client 'Ober')
  3. **Statistical validation** to ensure imputed rates reflected actual cost structures
- **Business Impact:** Enabled accurate cost allocation without excluding valuable work data

#### **3. Currency Normalization**

- **Challenge:** Mixed EUR (93%) and CHF (7%) transactions distorting comparative analysis
- **Solution:** Implemented currency conversion using conservative exchange rates, ensuring all financial metrics are comparable in EUR
- **Insight Discovery:** This correction revealed the true scale of billing gaps previously obscured by currency mixing

#### **4. Zero-Hour Work Classification**

- **Challenge:** Significant entries showed zero hours but represented real business activities
- **Solution:** Categorized as "Zero Hours - Overhead" to preserve cost visibility while clarifying business meaning

- **Strategic Value:** Made previously invisible operational costs visible for management review

## Analytical Framework Development

### 5. Core Metric Definition

- **Billing Efficiency %** = Billed Hours / Total Hours
  - Moved beyond theoretical "billability" to measure actual work conversion
  - **Finding:** 62.52% true efficiency vs. 90% theoretical capacity
- **Billing Gap Cost** = Cost of work marked "Billable" but not "Billed"
  - **Finding:** €631K in process improvement opportunities
- **Cost per Billable Hour** = Total Cost / Billable Hours
  - Enabled comparison of client service efficiency

### 6. Client Segmentation Strategy

- **Segmentation Logic:**
  - Excellent: ≥80% efficiency
  - Good: 60-79% efficiency
  - Problem: 40-59% efficiency
  - Critical: <40% efficiency
- **Implementation:** Dynamic classification ensuring segments reflect actual performance distribution

### 7. Prioritization Framework

- **Priority Scoring:**  $(\text{Billing Gap Cost} \times 2) + (\text{Billing Gap \%} \times \text{Total Cost})$ 
  - Balances absolute financial impact with relative inefficiency
  - Prevents small clients with high percentages from ranking above major opportunities
- **Action Tiers:**
  - **Urgent:** >20% gap + high absolute cost
  - **High:** Large absolute impact (>€75K) regardless of percentage
  - **Medium:** Notable inefficiencies with moderate impact
  - **Low:** Minor issues within acceptable variance

## Data Modeling & Visualization Architecture

### 8. Power BI Implementation Plan

- **Star Schema Design:**
  - Fact table: master\_table (transactions)
  - Dimension tables: Date, Client, Team
  - Relationships: Optimized for filter context and performance
- **DAX Measure Strategy:**
  - Time intelligence for trend analysis
  - Dynamic calculations responsive to user filters
  - Performance-optimized aggregations
- **Power Query ETL Pipeline:**
  - Automated data quality checks
  - Currency conversion logic
  - Client classification rules

### 9. Dashboard Design Principles

- **Executive-Focused Layout:**
  - Top: Key metrics and performance distribution
  - Center: Diagnostic matrix (efficiency vs. cost impact)
  - Bottom: Actionable opportunities (Top 5 billing gaps)
- **Visual Hierarchy:**
  - Color-coded by client segment
  - Interactive filtering and drill-through
  - Clear progression from insight to action

### 10. Scalability Considerations

- **Modular Architecture:** Business logic separated from data presentation
- **Parameterized Rules:** Thresholds and classifications easily adjustable
- **Performance Optimization:** Efficient DAX patterns and query folding
- **Maintainability:** Clear documentation and standardized naming

## **Business Impact & Strategic Insights**

### **11. Key Discoveries**

- **Process Gap:** €631K of approved work not converting to billed projects (7.9% leakage)
- **True Efficiency:** 62.52% actual conversion rate vs. initial 56% estimate
- **Client Concentration:** Top 3 clients represent 49% of total costs
- **Data Quality:** Currency mixing and missing rates as systemic issues

### **12. Recommended Actions**

1. **Immediate (30 days):** Address critical gaps in Rhdi (96% inefficiency)
2. **Short-term (90 days):** Standardize billing processes for top 5 opportunity clients
3. **Strategic:** Implement automated tracking to prevent future leakage

### **13. Methodology Validation**

- **Cross-Validation:** Excel and Power BI results reconciled
- **Business Logic Review:** All calculations validated against operational reality
- **Stakeholder Alignment:** Metrics designed for management decision-making
- **Scalability Assessment:** Solution extensible to additional data sources and business units

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## **Technical Implementation Notes**

### **Data Quality Controls Implemented:**

- Missing rate imputation with audit trail
- Currency conversion transparency
- Zero-hour work preservation with classification
- Client identification standardization

### **Performance Optimizations:**

- Efficient DAX measure design
- Appropriate use of calculated columns vs. measures
- Star schema relationship management
- Filter context optimization

**Business Rule Documentation:**

- All thresholds and classifications explicitly defined
- Conversion logic transparent and adjustable
- Segmentation rules based on actual performance distribution
- Prioritization methodology designed for actionability

This methodology demonstrates a comprehensive approach to transforming raw operational data into strategic business intelligence, balancing technical rigor with practical business applicability.