**Technical Specification**

**Project Title:** BI Dashboard for Competitor Project Analysis in the Construction Industry  
**Client:** Murat Buildings  
**Developer:** MAAB Innovation  
**Purpose:** Develop a BI dashboard to analyze, compare, and monitor Murat Buildings’ projects against competitors' active and completed projects, focusing on key metrics such as timelines, costs, resource utilization, and efficiency.

**1. Project Goals**

1. **Monitor Competitor Performance**: Compare Murat Buildings' project KPIs with competitors' similar projects.
2. **Identify Competitive Advantage**: Highlight cost efficiency, speed, and resource management advantages.
3. **Evaluate Internal Projects**: Assess Murat Buildings' performance across its own active projects.
4. **Strategic Recommendations**: Pinpoint improvement areas to optimize costs, timelines, and resource allocations.

**2. Functional Requirements**

**2.1. Dashboard Sections**

**2.1.1. Competitor Overview Dashboard**

* **Purpose**: High-level comparison of Murat Buildings’ active and completed projects with competitors.
* **KPIs**:
  + Total Project Cost (Planned vs. Actual)
  + Project Duration (Planned vs. Actual)
  + Cost per Square Meter
  + Number of Active Projects (by company)
  + Profit Margin per Project
* **Visualizations**:
  + Comparative Bar Charts (Project Cost & Duration)
  + Heat Map of Project Locations
  + Competitor Leaderboard: Ranking Companies by Efficiency
  + Cost per Square Meter: Scatter Plot

**2.1.2. Internal Project Analysis**

* **Purpose**: Assess Murat Buildings' project efficiency and profitability.
* **KPIs**:
  + Budget Deviation: Planned Cost vs. Actual Cost
  + Milestone Completion Rate
  + Resource Allocation (Labor/Materials)
  + Cost Overrun Percentage
  + ROI per Project
* **Drill-Through Options**:
  + View resource usage breakdown (Materials, Labor)
  + Analyze milestones: Completed vs. Delayed
* **Visualizations**:
  + Line Chart: Budget Over Time
  + Gantt Chart: Project Timelines
  + Pie Chart: Resource Allocation
  + Milestone Status Table

**2.1.3. Competitor Deep Dive**

* **Purpose**: Analyze specific competitor projects to uncover strengths and weaknesses.
* **KPIs**:
  + Project Completion Rate (On-time %)
  + Average Project Cost per Competitor
  + Resource Utilization Efficiency
  + Duration Deviation (Planned vs. Actual)
* **Visualizations**:
  + Competitor Benchmark Table: Compare Murat Buildings vs. Competitor KPIs
  + Radar Chart: Highlight key performance metrics
  + Project Timeline Comparison Chart

**2.1.4. Strategic Opportunity Analysis**

* **Purpose**: Highlight opportunities for cost reduction, efficiency improvements, and competitive positioning.
* **Insights**:
  + Which competitor delivers projects faster or at lower cost?
  + Identify areas where Murat Buildings can optimize resources.
  + Highlight regions with significant competitor activity and potential growth opportunities.
* **Visualizations**:
  + Opportunity Heatmap: Regions for growth or efficiency gains
  + Top 5 Areas for Improvement Table
  + Competitive Advantage Chart: Cost and Duration Analysis

**3. Data Structure**

| **Table Name** | **Description** | **Fields** |
| --- | --- | --- |
| **Projects** | General project details for all companies. | ProjectID (PK), CompanyID, ProjectName, Region, StartDate, EndDate, PlannedCost, ActualCost, SquareMeters, Status |
| **Companies** | Competitor and Murat Buildings information. | CompanyID (PK), CompanyName, TotalProjects, MarketShare, ReputationScore |
| **Milestones** | Project progress tracking. | MilestoneID (PK), ProjectID (FK), Name, PlannedCompletion, ActualCompletion, Status |
| **Resources** | Resource usage for each project. | ResourceID (PK), ProjectID (FK), Type (Labor/Material), Quantity, Cost |

**4. Key KPIs**

| **KPI** | **Description** | **Formula** |
| --- | --- | --- |
| Total Project Cost | Compare planned vs. actual costs. | SUM(ActualCost) |
| Cost per Square Meter | Cost efficiency based on project size. | ActualCost / SquareMeters |
| Budget Deviation | Deviation from the planned budget. | (ActualCost - PlannedCost) / PlannedCost |
| Average Project Duration | Compare timelines across projects. | DATEDIFF(EndDate, StartDate) |
| Resource Utilization Efficiency | Resource performance tracking. | PlannedQuantity / ActualQuantity |
| Milestone Completion Rate | On-time milestone delivery. | (CompletedMilestones / TotalMilestones) |

**5. Technical Requirements**

* **Mock Data Generation**: Students will create datasets manually or using tools like:
  + **Excel/Google Sheets**
  + **Python Libraries** (Faker, Pandas)
  + **Mockaroo or similar platforms**
* **Platform**: Microsoft Power BI (or other BI tools).
* **Performance**: Dashboard response time ≤ 30 seconds.
* **Accessibility**: The dashboard must work on desktop and mobile devices.

**6. Implementation Roadmap**

1. **Data Generation**:
   * Simulate competitor and Murat Buildings’ project data.
   * Include timelines, costs, milestones, and resource usage.
2. **Data Model Development**:
   * Design relational tables for projects, companies, milestones, and resources.
3. **Dashboard Development**:
   * Build visualizations for competitor analysis, internal project tracking, and opportunities.
4. **Testing and Validation**:
   * Ensure all KPIs are calculated correctly and visualizations align with objectives.
5. **Final Delivery**:
   * Publish the dashboard and document insights for analysis.

**7. Expected Outcome**

* A BI dashboard enabling Murat Buildings to compare their project performance against competitors.
* Strategic insights into cost optimization, timeline efficiency, and growth opportunities.
* Mock datasets ready for demonstration and practice.

***Note for Students:*** *Since this is a simulated project, you will create the data yourself. Use realistic assumptions for costs, timelines, and resource usage. Feel free to add more KPIs, charts, or analytical insights to make the project your own. Think creatively!*