**Studify Report Creation Documentation**

**SSIS Integration with SSAS Cubes**  
**Environment**: Visual Studio with SQL Server Data Tools (SSDT)

**1. Introduction**

This document outlines the detailed technical procedures followed to create analytical reports for the Studify platform. The reports were built by extracting data from existing OLAP cubes hosted on a SQL Server Analysis Services (SSAS) instance.  
The extracted data was processed using SQL Server Integration Services (SSIS) within Microsoft Visual Studio, with the final outputs prepared for visualization in reporting platforms such as Power BI, SSRS, or Excel.

The purpose of this documentation is to ensure that the methodology, design decisions, and step-by-step implementation process are properly recorded for future reference, maintenance, or audits.

**2. Environment Setup**

The report creation process was conducted in the following software environment:

* **Visual Studio 2019** with the **SQL Server Data Tools** extension installed.
* **SQL Server Integration Services** (SSIS) project template enabled.
* Access credentials to the **SQL Server Analysis Services** (SSAS) server hosting the OLAP cubes.
* Access to a destination **SQL Server Database** for storing extracted and transformed data.

Prerequisites:

* Confirm installation of **Microsoft OLE DB Provider for Analysis Services**.
* Verify permissions to read from the OLAP cubes and to write into the destination database.

**3. Project Initialization**

Upon opening Visual Studio:

* A new project was created using the **Integration Services Project** template.
* The project was named Studify\_SSIS\_Reports.
* A folder structure was established within the solution to separate Data Flow Tasks and Connection Managers logically.

Within the project:

* **Connection Managers** were added for:
  + The SSAS source connections (one per cube if necessary).
  + The SQL Server destination database connection.

All connections were tested individually to ensure successful authentication and connectivity.

**4. Data Source Overview**

Three OLAP cubes were accessed:

1. **Cart Analysis Cube**: Focused on shopping cart activities.
2. **Enrollment Analysis Cube**: Focused on student enrollments and course completion statistics.
3. **Sales and Revenue Cube**: Focused on completed transactions, revenue, and discount metrics.

Each cube provided dimensions and measures relevant to the reports that were required.

**5. Report Development Process**

For each report, the following standard procedure was applied:

1. **Creation of a new Data Flow Task** inside the SSIS package dedicated to the report.
2. **Connection to the appropriate SSAS Cube** using an Analysis Services Data Source component.
3. **Selection of Dimensions and Measures**:
   * Dimensions were selected to provide the necessary context (e.g., Category, Country).
   * Measures were selected to provide numerical data (e.g., Enrollment Count, Revenue).
4. **Configuration of Extraction Parameters**:
   * Hierarchies were flattened to simplify downstream transformations.
   * Filters were applied where necessary to limit data to relevant scopes.
5. **Data Transformation**:
   * Handling of null values (e.g., replacing missing cities or states with "Unknown").
   * Standardization of field names and data types.
6. **Loading Data to Destination**:
   * Target tables were created in the SQL Server database.
   * Field mappings between the SSAS output and the SQL tables were defined explicitly.
7. **Validation**:
   * Cross-validation of extracted data against the cube browser to ensure accuracy.

**6. Detailed Report Descriptions**

**6.1 Enrollment by Category Report**

* **Source Cube**: Enrollment Analysis Cube
* **Extracted Dimensions**: Course Category, Sub-Category
* **Extracted Measures**: Total Enrollment, Completion Rate, Average Rating, Average Grade
* **Process Details**:
  + The Data Flow Task titled "EnrollmentByCategory" was created.
  + The Analysis Services Source component was configured to extract Category and Sub-Category attributes alongside the chosen measures.
  + No transformations were required beyond data type standardization.
  + Data was loaded into the table Studify\_EnrollmentByCategory in the destination SQL database.
* **Report Purpose**: This report allows analysis of enrollment metrics broken down by course categories and sub-categories.

**6.2 Enrollment by Country Report**

* **Source Cube**: Enrollment Analysis Cube
* **Extracted Dimensions**: Country, State, City
* **Extracted Measures**: Enrollment Count, Completion Rate, Average Rating, Average Grade
* **Process Details**:
  + A separate Data Flow Task named "EnrollmentByCountry" was created.
  + Geographic data hierarchy was flattened during extraction to allow row-level analysis.
  + NULL values in city or state fields were replaced with "Unknown".
  + Data was loaded into Studify\_EnrollmentByCountry.
* **Report Purpose**: To analyze student enrollment trends across various geographical locations.

**6.3 Revenue by Category Report**

* **Source Cube**: Sales and Revenue Cube
* **Extracted Dimensions**: Course Category, Sub-Category
* **Extracted Measures**: Revenue, Total Orders, Average Order Price, Average Discount
* **Process Details**:
  + A new Data Flow Task "RevenueByCategory" was created.
  + Revenue measures were extracted and mapped directly.
  + Fields were formatted to represent currency properly where necessary.
  + Output was directed to Studify\_RevenueByCategory.
* **Report Purpose**: To provide insights into revenue generation segmented by course categories.

**6.4 Revenue by Location Report**

* **Source Cube**: Sales and Revenue Cube
* **Extracted Dimensions**: Country, State, City
* **Extracted Measures**: Total Orders, Total Revenue, Average Price, Average Discount
* **Process Details**:
  + A Data Flow Task named "RevenueByLocation" was created.
  + Location hierarchy was extracted and flattened.
  + Missing location information was replaced appropriately.
  + Data loaded into Studify\_RevenueByLocation.
* **Report Purpose**: To analyze sales revenue across different geographical areas.

**6.5 Carts by Category Report**

* **Source Cube**: Cart Analysis Cube
* **Extracted Dimensions**: Course Category, Sub-Category
* **Extracted Measures**: Total Amount, Total Carts, Total Students Cart, Total Courses Cart
* **Process Details**:
  + A Data Flow Task titled "CartsByCategory" was created.
  + Extracted cart behavior data categorized by course topics.
  + Data loaded into Studify\_CartsByCategory.
* **Report Purpose**: To monitor cart additions and interest levels across course categories.

**6.6 Carts by Country Report**

* **Source Cube**: Cart Analysis Cube
* **Extracted Dimensions**: Country, State, City
* **Extracted Measures**: Total Amount, Total Carts, Total Students Cart, Total Courses Cart
* **Process Details**:
  + A final Data Flow Task called "CartsByCountry" was established.
  + Extraction included geo-based cart activity.
  + NULLs handled as "Unknown" and data was loaded into Studify\_CartsByCountry.
* **Report Purpose**: To examine shopping cart behaviors geographically.

**7. Quality Assurance and Validation**

After the extraction and loading processes were completed:

* Sample records were manually compared with SSAS cube outputs.
* Data totals were cross-verified (e.g., sum of Total Enrollments, Total Revenue).
* Random samples were checked for correct dimension mappings (e.g., correct City under correct State and Country).

Any inconsistencies were resolved by:

* Reviewing field mappings.
* Ensuring filters or slicers at the cube level were correctly set.
* Adjusting extraction configurations if necessary.

**8. Best Practices Followed**

* Separation of each report's ETL logic into distinct Data Flow Tasks for modularity and easier maintenance.
* Usage of descriptive names for tables and fields.
* Management of NULL and missing data at the ETL layer itself to avoid downstream reporting issues.
* Maintaining project-level connection managers to ensure consistency.
* Regular intermediate saves and incremental validation after each report creation.

**9. Conclusion**

This document provides a detailed technical description of the steps followed to build the Studify analytical reports. By adhering to best practices in ETL design and ensuring careful extraction from SSAS cubes, a robust, accurate reporting foundation was established.  
This approach allows stakeholders to make data-driven decisions based on reliable and consistent insights.