

GSU/GBI

Onsite Education/Consulting – June 22 – 26, 2009

Authored by: Robert Bovino, Education Specialist, IBM Cognos Education

Training Participants: Nadia Borissova GSU, Charlotte Trawick GBI, Dwayne Lee GBI, Robert Bovino, IBM Cognos Education

Objectives: To continue the Metadata Modeling, OLAP training/development and building of the GBI UCR crime analysis data warehouse. The team has identified the following star schema structures for GBI/GSU crime analysis reporting;

1. **Homicide Star Schema** – This was the initial star schema designed and developed as a proof of concept during the last onsite session. Reporting was tested and found to be performing as expected with accurate predictable results. Since our last meeting GBI has appended the Homicide transaction fact table with additional years from 2002 with the goal to have history back to 1995.
Issue: High Level Chart reporting contained too many categories at the ORI level (651 ORI Agency/categories) to flat of a dimension caused too many categories on the X axis of the report.
Solution: The team created additional intermediate levels in the ORI/Agency dimension to build hierarchical structure for improved high level to low level analysis and will enable more meaningful cubes for drill down and drill up functionality.
Additional levels added to the ORI Dimension; Country, State, GBI Regions, County. Adding these levels provides greater breath and depth to the overall reporting.
2. **Return “A” Star Schema (UCR Part I Crimes)** – The Return “A” star schema (Monthly Return of Offenses Known to the Police) contains the required keys to join to the already built Time and ORI dimensions (Conformed Dimensions). The Return “A” fact contains all summarized Crime statistic facts submitted by all the agencies for the State of Georgia by classification of offenses.
3. **Supplemental Return “A” Star Schema (UCR Part I Crimes)** - also contains the required keys to join to the Time and Agency (ORI) Dimensions. Star Schema grouping was created and published.
4. **Age/Sex/Race Arrest Star Schema** – The A/S/R Arrest Fact is joined to keys in the Time, Agency and Arresting Offense dimensions.
5. **Arson Star Schema** – Arson fact is joined to keys in the Time and Agency dimensions.
6. **LEOKA (Law Enforcement Officers Killed or Assaulted) Star Schema** – LEOKA Fact is joined to the Time and Agency dimensions.
7. **Hate Crime Star Schema** – Will be added at a later date.
8. **Family Violence Star Schema** – Pending completion – Nadia will work with Charlotte on the SQL2005 data loads and complete the design in Framework Manager for presentation in the GBI UCR Crime Analysis Reporting package.
9. **Population Star Schema** – Deferred to a later date. There are conformity issues with data related to level association at the County/City level. We need to tie the GBI breakdown of county/region/city so it will conform to the State Census Bureau data. Pending further analysis.

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Rework/Update Modifications:

Update the Agency (ORI) Dimension to accommodate the additional levels for the State of Georgia GBI Crime Reporting; State, Region Code, Region Name, County Code, County Name. Create a lookup table for updating the ORI Dimension with the required row level data for category generation (adding additional row level information).

Wednesday we created our first Homicide Crime Analysis OLAP development project using the Homicide Star Schema. Data Sources were imported from the C8 Package derived from the newly created GBI UCR/Crime Statistics Data Warehouse. The data sources imported for the dimension and fact builds consisted of the following; Homicide Fact, Time, Agency, Homicide Type, Homicide Situation, Offender Circumstance, Offender Weapon, Offender Age, Offender Ethnic Origin, Offender Race, Offender Sex, Offender Relationship, Offender Subtype, Victim Age, Victim Ethnic Origin, Victim Race, Victim Sex. After completing the build and generating categories we determined an issue with the time generation based on the calculated date key in the Homicide Fact. We resolved the issue by reconstructing a date column in SQL Server 2005 in both the Time Dimension and each fact table build. This caused rework of the dimension and fact builds in Framework manager and republishing of the star schema groupings.

Considerations: Creating a mirrored separate database of the GBI Crime reporting Data warehouse for separate reporting and development by GSU, i.e. if GSU in the future begins sourcing State Level Crime Clearing houses for the entire US, the infrastructure will be in place for such an expansion. Also, by Adding Country and Continent level to the ORI Dimension it will allow expansion of the project at the international level for Global Crime and Anti-Terrorism analysis.

GBI Future Reporting Opportunities Identified

GBI currently maintains a Criminal History tracking application which captures all Criminal history for the State of Georgia. This data is used by the GBI, Law Enforcement Agencies and by the State of Georgia Judicial Courts for tracking and maintaining Criminal History activity. The GBI envisions reporting this data via IBM Cognos 8.4 by constructing a Criminal History Data warehouse for Criminal History reporting and analysis.

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GBI Future Reporting Opportunities Identified cont.

Recommendations:

1. To conduct an analysis of the Criminal History reporting requirements.
2. Identify star schema requirements for reporting (fact and dimension builds).
3. Analyze the Criminal History OLTP Oracle database schema to identify sources for the fact and dimension builds (offline modeling using the Criminal History database schema).
4. Identify the target database for the data warehouse (Oracle or SQL2005).
5. Identify project team members consisting of a project team sponsor/champion, Project Team Lead, subject matter experts for both reporting and OLTP database analysis.
6. Technical support will also be required to include an Oracle/SQL Server DBA, Data Warehouse Solution Architect/Metadata Modeler and a Cognos 8 Reporting Developer.