Writing Reports from a Data Warehouse Using Cognos

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Outline

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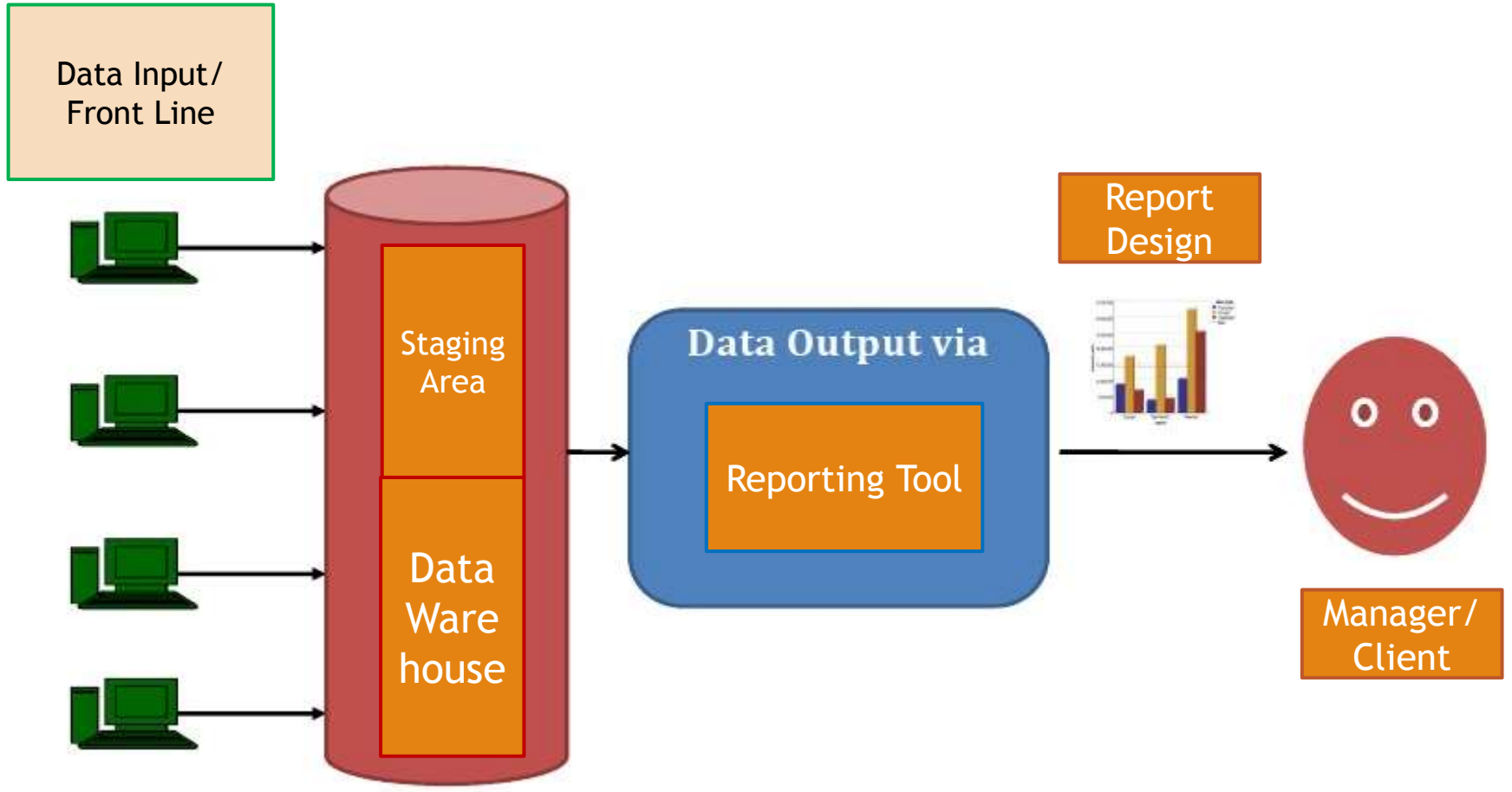
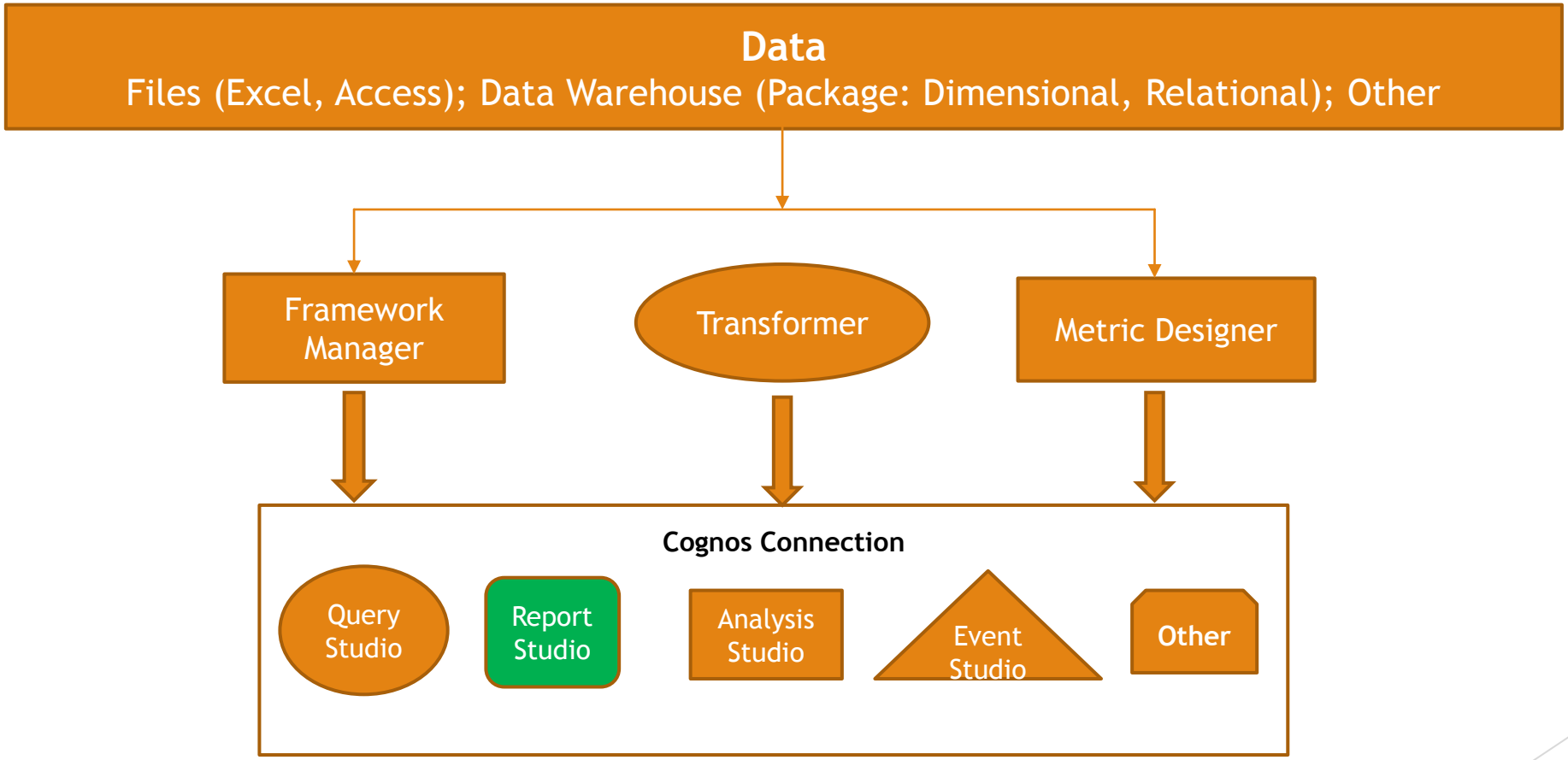
  - Evolution of Cognos
  - Cognos at SHSU
- SHSU Data Flow Chart, IR Reports and Support
- Planning and Developing the Cognos Report
- Creating the Cognos Report
  - Initial Design
  - Variables
- Writing and Reviewing the Cognos Report
- Tips
- Questions

Data Warehouse Components



Cognos Business Intelligence Components



Evolution of Cognos

- 1969 - Founded by Alan Rushforth and Peter Glenister, Ottawa, Ontario
- 1979 – Developed their first software product for consulting
- 1982 – Adopted the Cognos name, borrowed from the Latin word “cognosco,” (“knowledge from personal experience”) and moved into software sales
- 2008 – IBM acquired Cognos. (SAP and Oracle were acquiring their own BI products.)
- 2010 – IBM brought Cognos and SPSS together to form its Business Analytics division
- Currently, Cognos Business Intelligence and Performance Management Suite includes about three dozen software products, include reporting, analysis, dashboard and scorecards delivered through a web-based server.

Features of Cognos as a Web-based Analytics Tool

- Supports decision-making for management, operations, and planning level of an organization.
- Informs decisions based upon business performance
  - Dashboards
  - Data analysis and reporting
  - Cognos 10 (newest version) can be accessed online or through mobile devices
- Integrates with other systems – Extraction, Transformation & Loading (ETL) tool.
  - SHSU: Banner ERP (raw data) integrates with Cognos
- Multiple users can simultaneously use it from around the world.
- Security solutions offer complete control over the report delivery method and access.

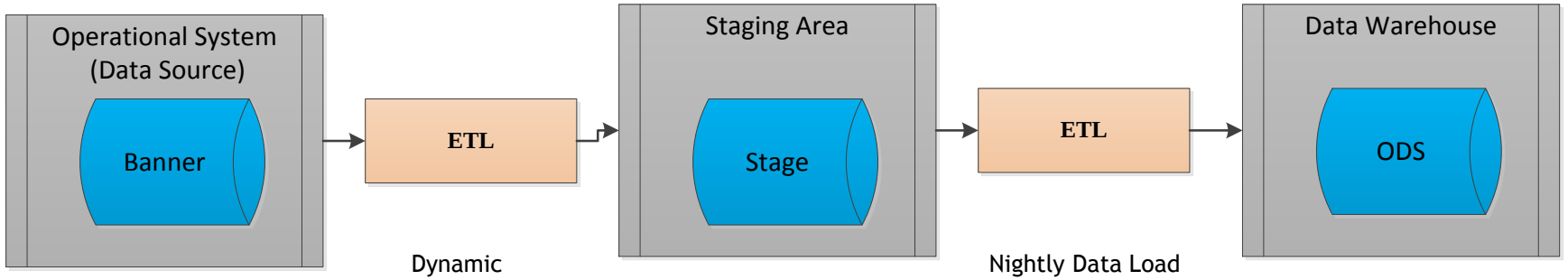
Cognos at Sam Houston State

- Beginning in 2010, SHSU initiated steps to replace its 40-year old Legacy database

- Enterprise Resource Planning Modules
  - Implemented in 2010 – Ellucian's (formerly SunGard) Banner 8 Financial Aid module
  - Implemented in 2011 – Ellucian's Banner 8 Student, Finance, Human Resources & Payroll, and Relationship Management modules

- Users
  - Report Studio for Business Analysts – IR staff and Business Analysts with pivots and queries
  - Query Studio – for users with moderate skills to access limited information
  - Dashboards - Management, Cognos 10, new version expected to be launched in 2014

SHSU Data Flow Chart
Loading the Data Warehouse

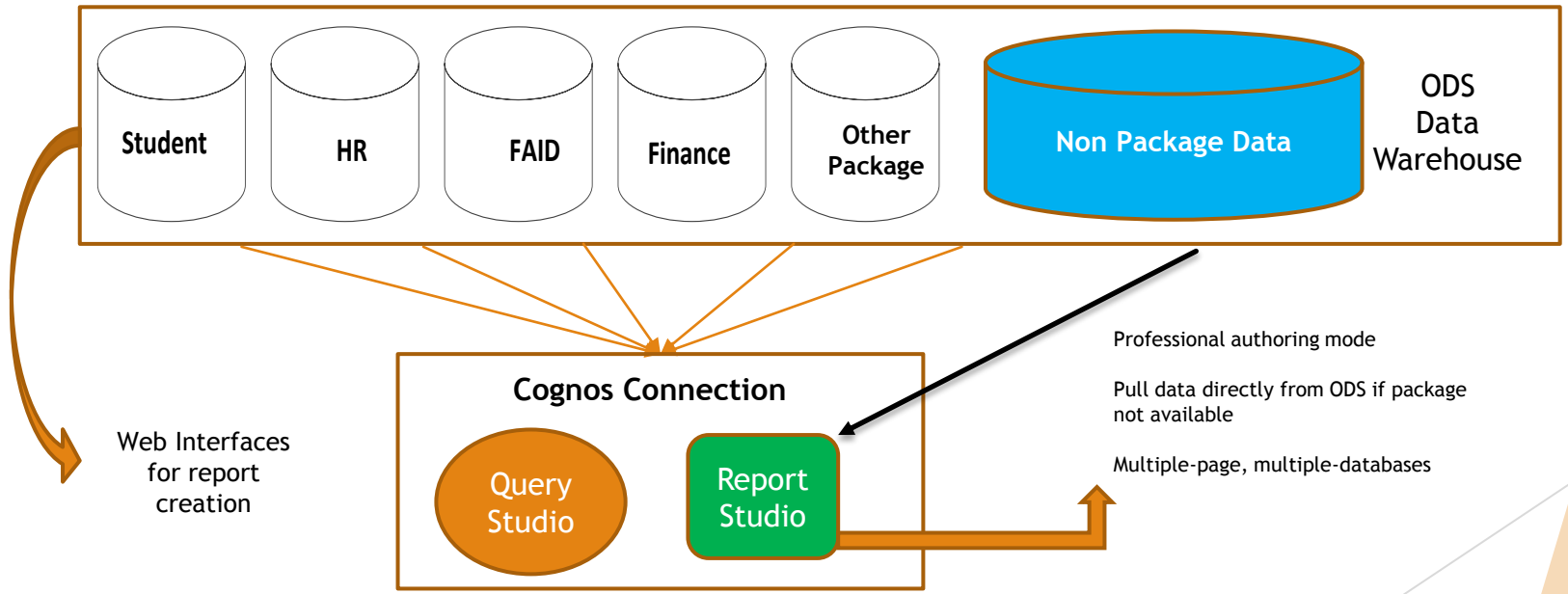


- ETL –
  - **Extraction**: process of reading data from data source
  - **Transformation**: process of converting the extracted data from previous form into the desired state by using rules or look up tables
  - **Loading**: process of writing the data into a target database

- Staging Area – holds data for extended periods of time for archival or troubleshooting purposes
  - Source data are only available for extraction; less than overall data loading time
  - Data warehouse's loading frequency does not match with the refresh frequencies of the source systems
  - Extracted data - in multiple places (ODS loading, third-party applications, etc.)

SHSU IR - Report Creation

- Cognos Connection –
  - Web portal, create and run reports, and perform administrative tasks, such as scheduling reports
  - Package – a subset of a model of the metadata; Framework manager by IT



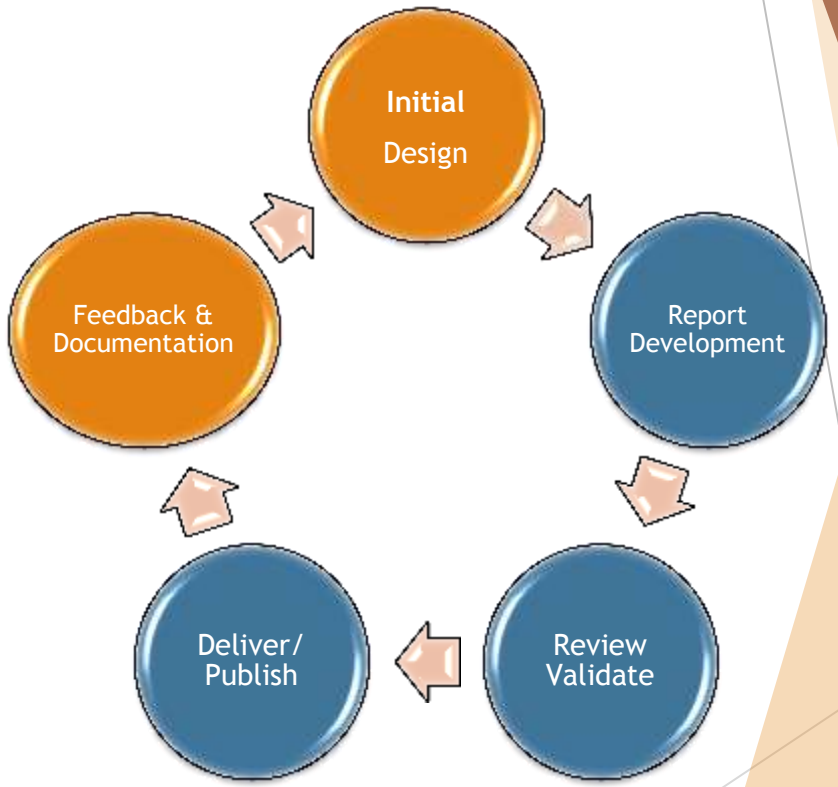
Support

- Information Technology (IT Support)
  - Provide package(s) as requested by Institutional Research staff
  - Knowledge of Framework model and reporting practices in existing projects
  - Technical resources with Cognos expertise

- Functional User
  - Understands the data and process
  - Understands unique business concepts/Knowledge of business requirements
  - Shares/manages the reports

Planning the Cognos Report

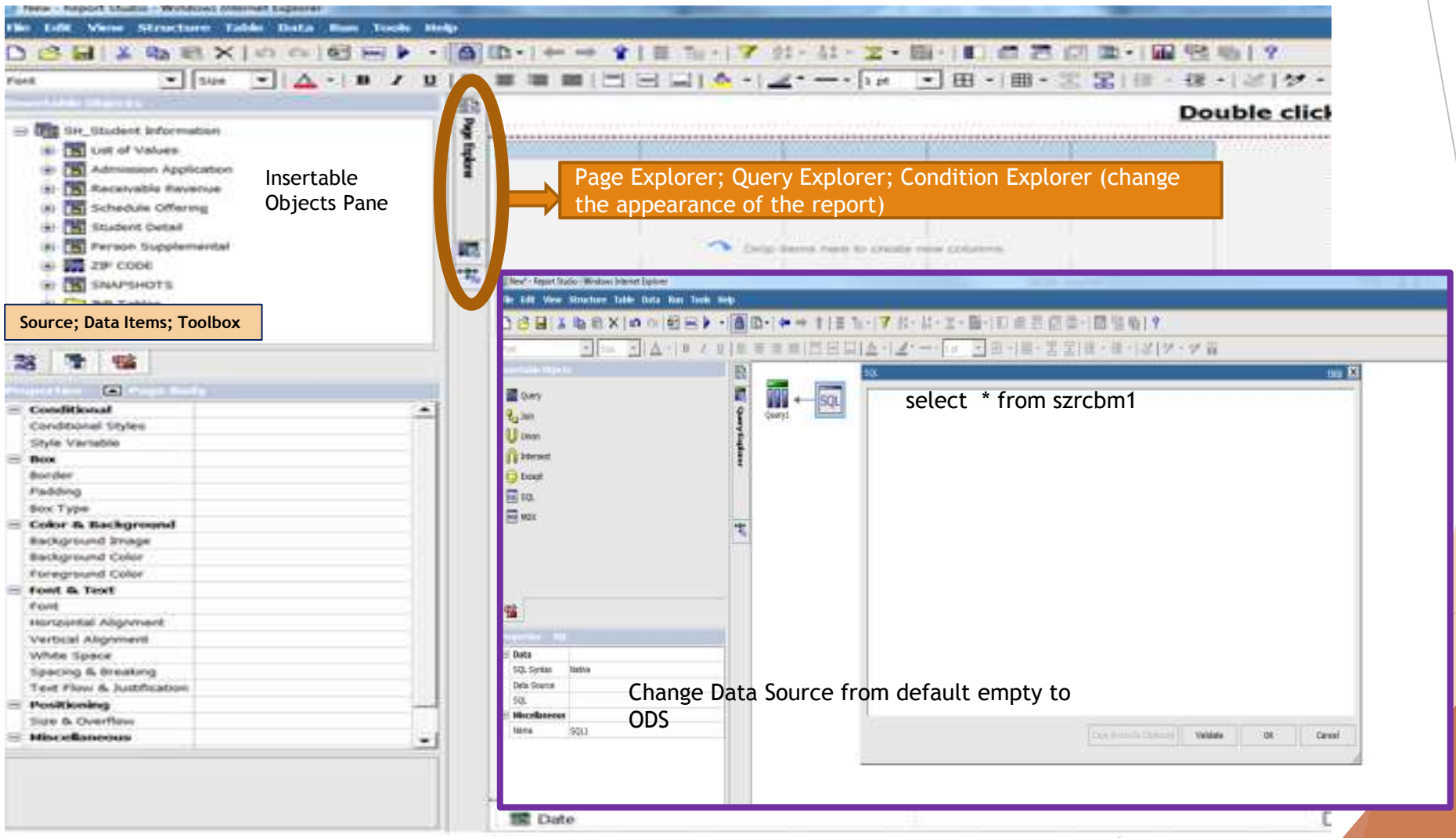
- **Types of Reports**
  - New Reports without Template – Analysis, Scheduled
    - Initial Design – Planning Reports
      - Understanding business needs and requirements
      - Designing the report based upon specifications
      - Choose layout - Essential to ensure the information in the report is presented in a clear and effective manner
    - Report Development
    - Review and Validate Data
    - Deliver – Cognos portal, e-mail
    - Feedback & Documentation
  - Fill data into existing Table – Common Data Set
    - Three Steps



Developing the Cognos Report

- New Reports without a Template
  - Select a data source – Package or non-package data (If no Framework model, no package published using that model – use SQL query.)
  - Choose a Report Type –
    - List, Crosstab, Charts, etc.
  - Design a Query
  - Choose a Reporting Style – Data Source
    - Relational (data as tables and columns - SQL) - Displays records that exist in the result set.
    - Dimensional (data in multiple dimensions intersecting at cells – MDR) - Displays every member unless you remove it.

Report Studio – User Interface



SQL Query Workflow vs. Cognos Report Studio Query

SQL Syntax Structure

Select	• Variables in the Report
From	•Tables •Views
Join / Union	• Left • Right (Optional clause) • Full
Where /Having	• Condition / Calculation
Group by	• Class (Optional clause)
Order by	• Decs / Aced (Optional clause)

Cognos Report Studio Query

Select (Display Variables in the report)

From (Data source – no package published)

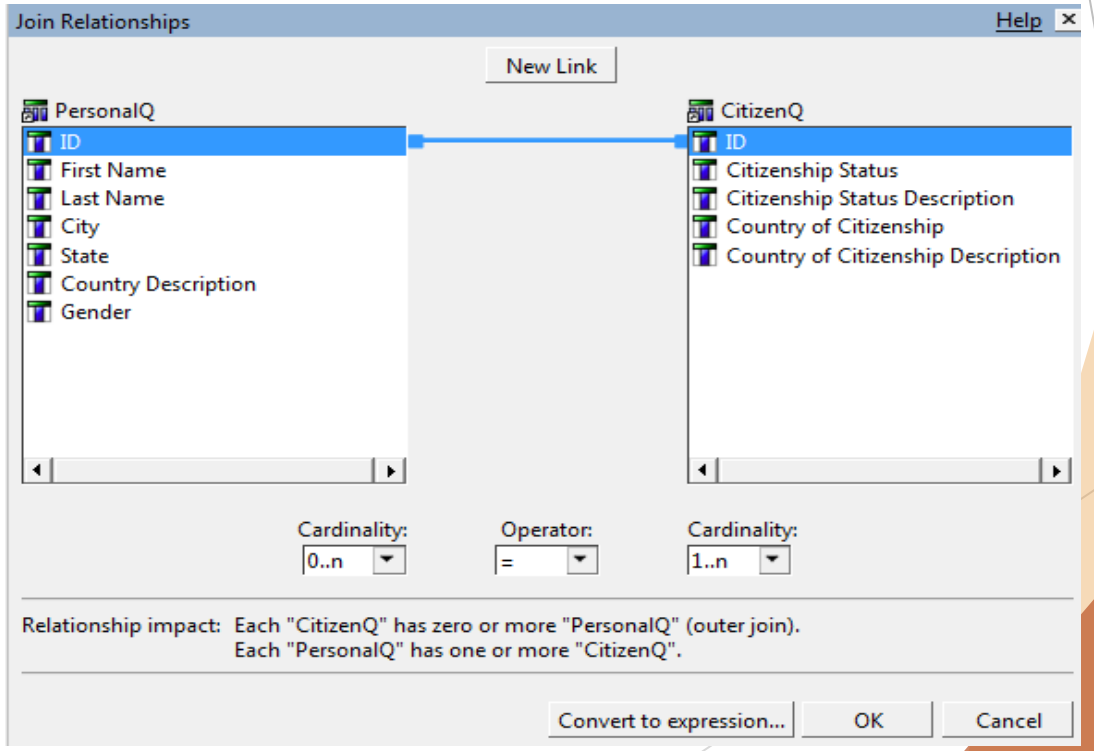
Toolbox – Insertable Objects

Filter

Tool 

Creating Joins in Cognos

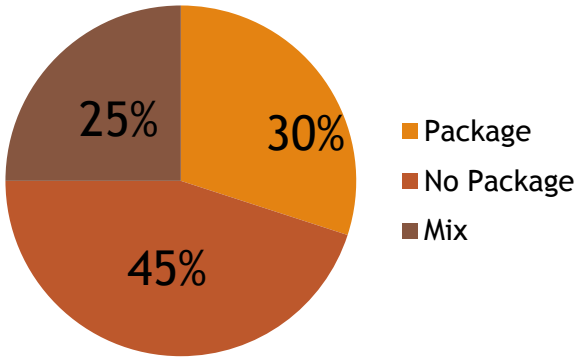
- Report Studio – Create two queries in one report
- Create joins between Query Subjects 
  - Between Query Subjects which have not been joined using the Framework Manager tool, or those that have been joined, for which the report writer needs to enforce his own join relationship, overriding the relationship defined in Framework Manager.
- Cartesian Production: Relationship which joins each row from Table A to each row in Table B. The lower the cardinality, the more duplicated recorder.
  - One-to-one relationship (1:1)
  - One-to-many relationship (1:N)
  - Zero-to-one (0:1)
  - Zero-to-many (0:N)



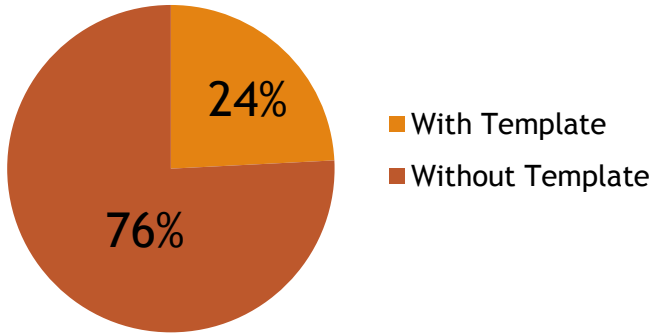
SHSU IR Reports

- IR 2012/13 Reports Analysis
  - Total Reports – 375
  - Data Source
    - CB data – No Package
    - IR_Freeze Data – No Package
    - Operational Data Store (ODS) data - Package

Data Source



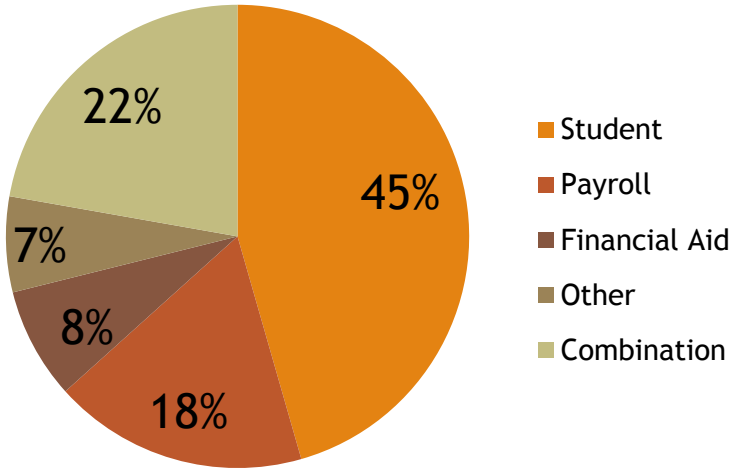
Report Type



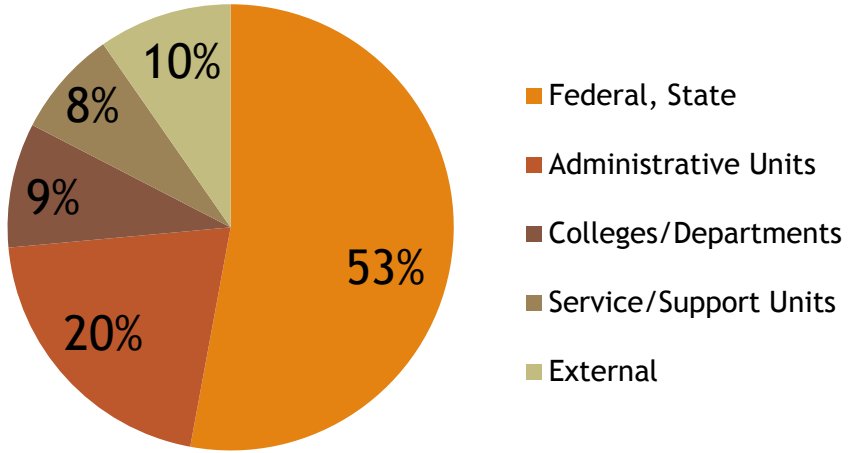
SHSU IR Reports

- Report Content – Student-related, especially Enrollment
- Report Requester – College and Department personnel

2012 Reports by Content



2012 Reports by Requestor



Creating the Cognos Report

- Report Requester – Administrative Units
- Sample Goal – Create a new report illustrating the Longitudinal Study of Undergraduates
  - Enrollment Trends – classification, demographic information
  - Retention Rates
  - Graduation Rates
- Data Source – CBM001, CBM009
- Package not available - CB data
  - Report Studio
  - SQL query pulls data directly from ODS when package is not available
- Support – Registrar's Office, IT (manages TCC tables and processes scripts)

Initial Design

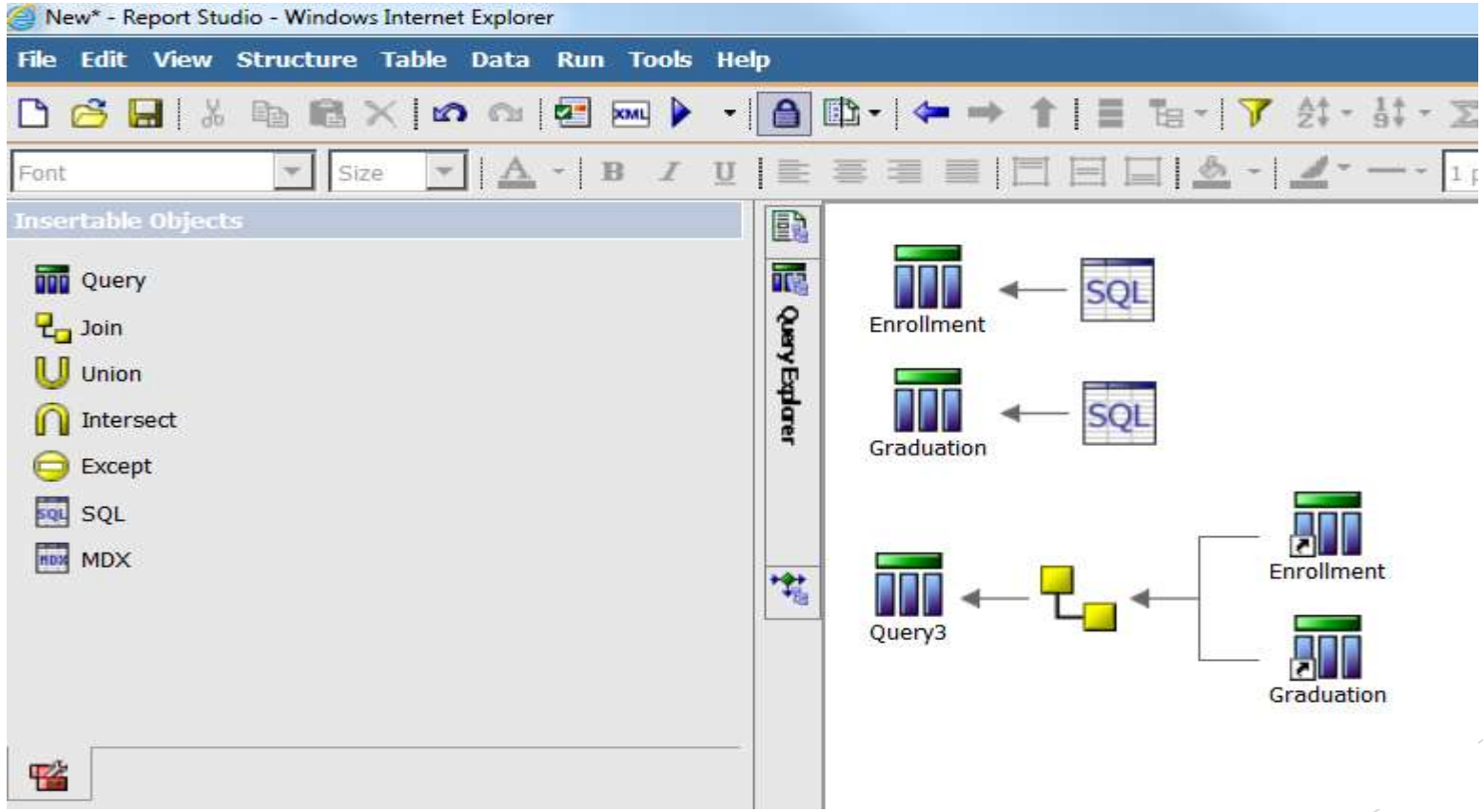
- Initial Design
  - Communicate with report requestor
    - Understand the purpose of the report
    - Determine if report is for internal/external use
    - Agree on definitions and terms – ex. retention Fall to Fall
  - Determine best presentation format to meet requestor's needs/purpose
    - Draft Table
    - Title, Headers, Labels
    - Formats

Determining the Data Variables

- Better understand the data variables
  - Do not use a variable based only on its name
    - FT – Full Time or First Time
  - Manual – understand data definitions in the manuals (CB), metadata
  - Functional Unit – understand how and when the data enters the data system, such as identifying the flex entry student
- Possible data issues – there is no perfect data, but there is good enough once everyone understands definitions and limits on data/access

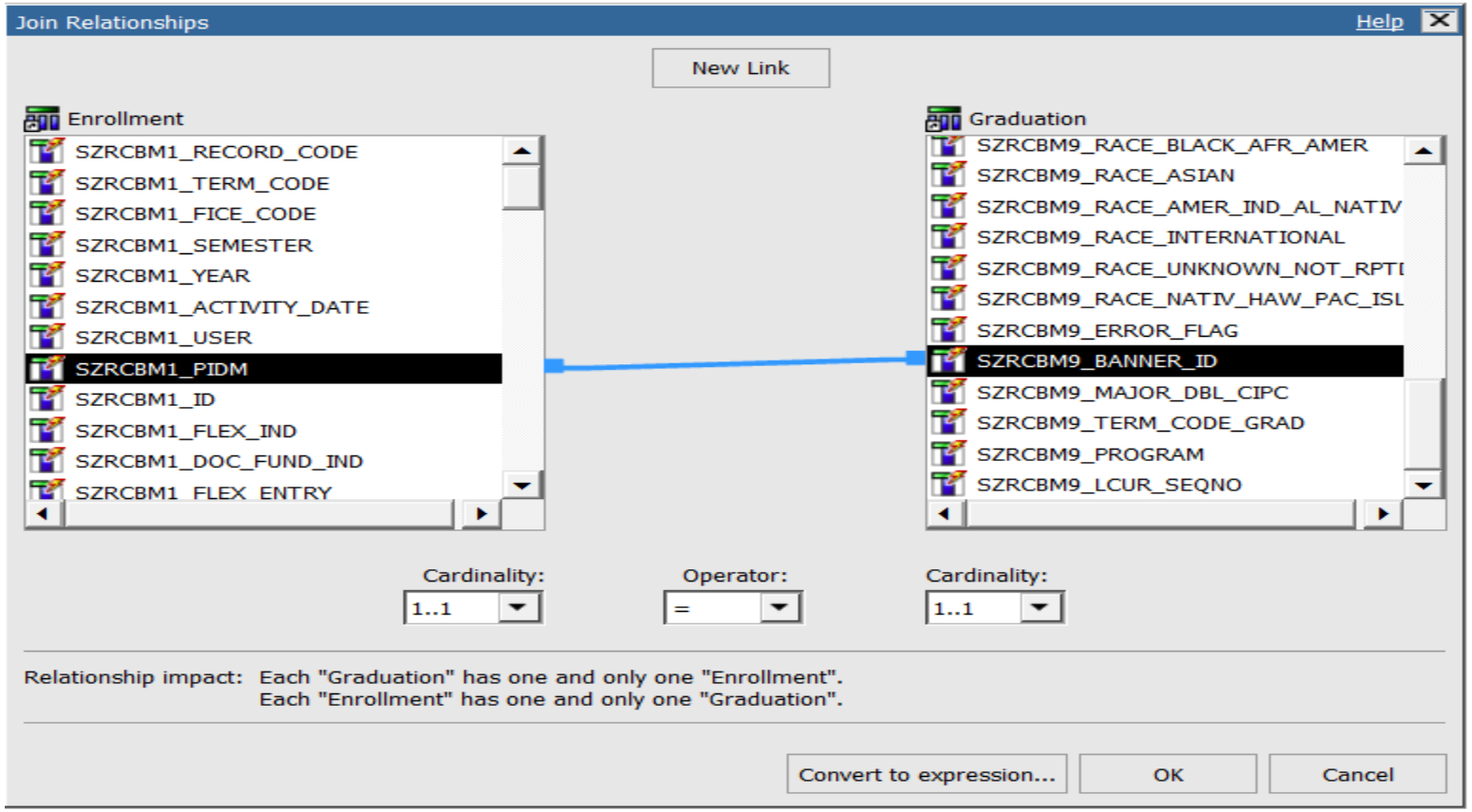
Writing the Cognos Report

- Sample - Create Two Queries
  - Query 1 (Enrollment) - Select * from CBM001
  - Query 2 (Graduation) - Select * from CBM009



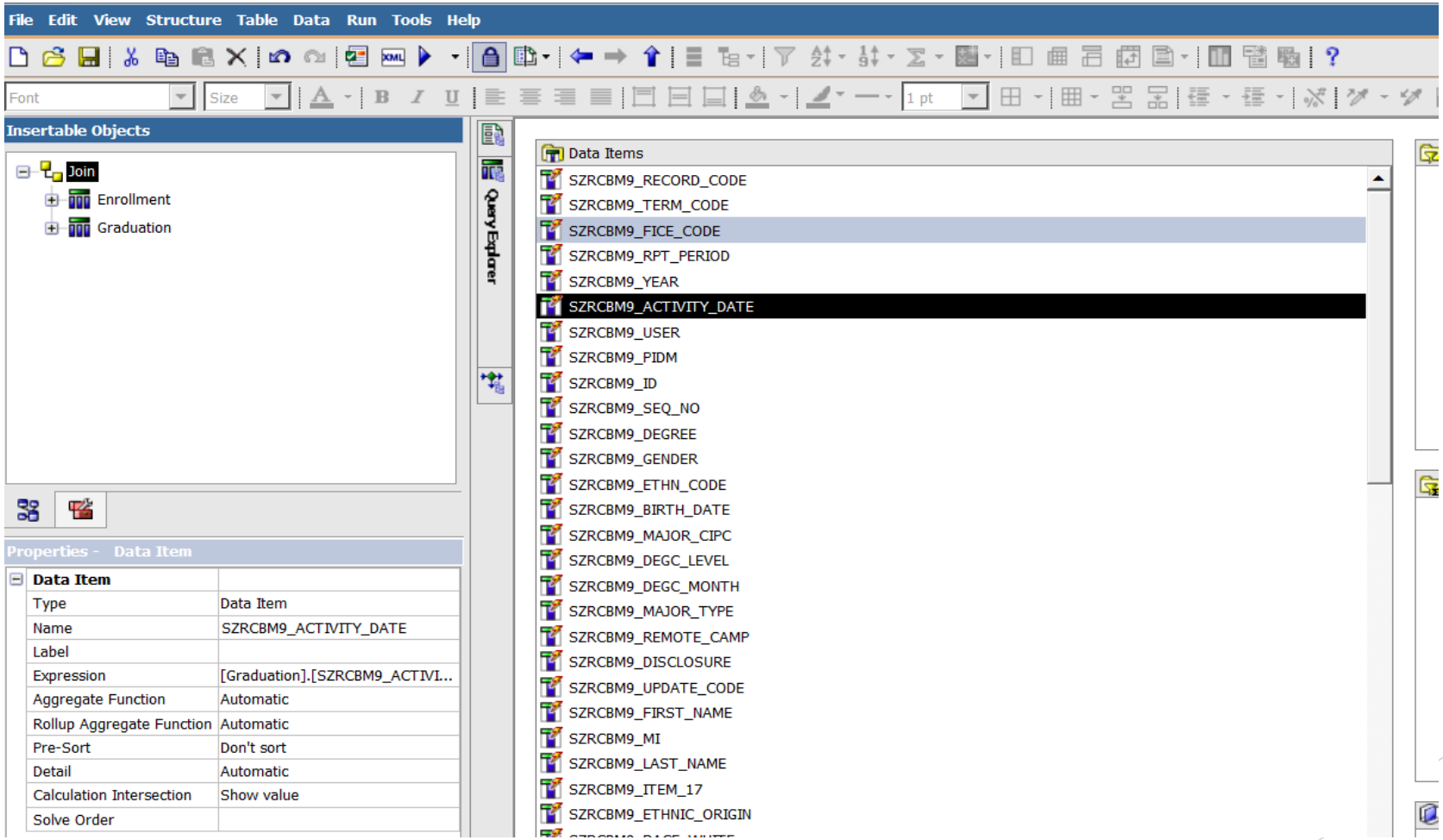
Writing the Cognos Report

- Cardinality join: Ex. One-to-one relationship (1:1). Establish join relationship without writing SQL script.



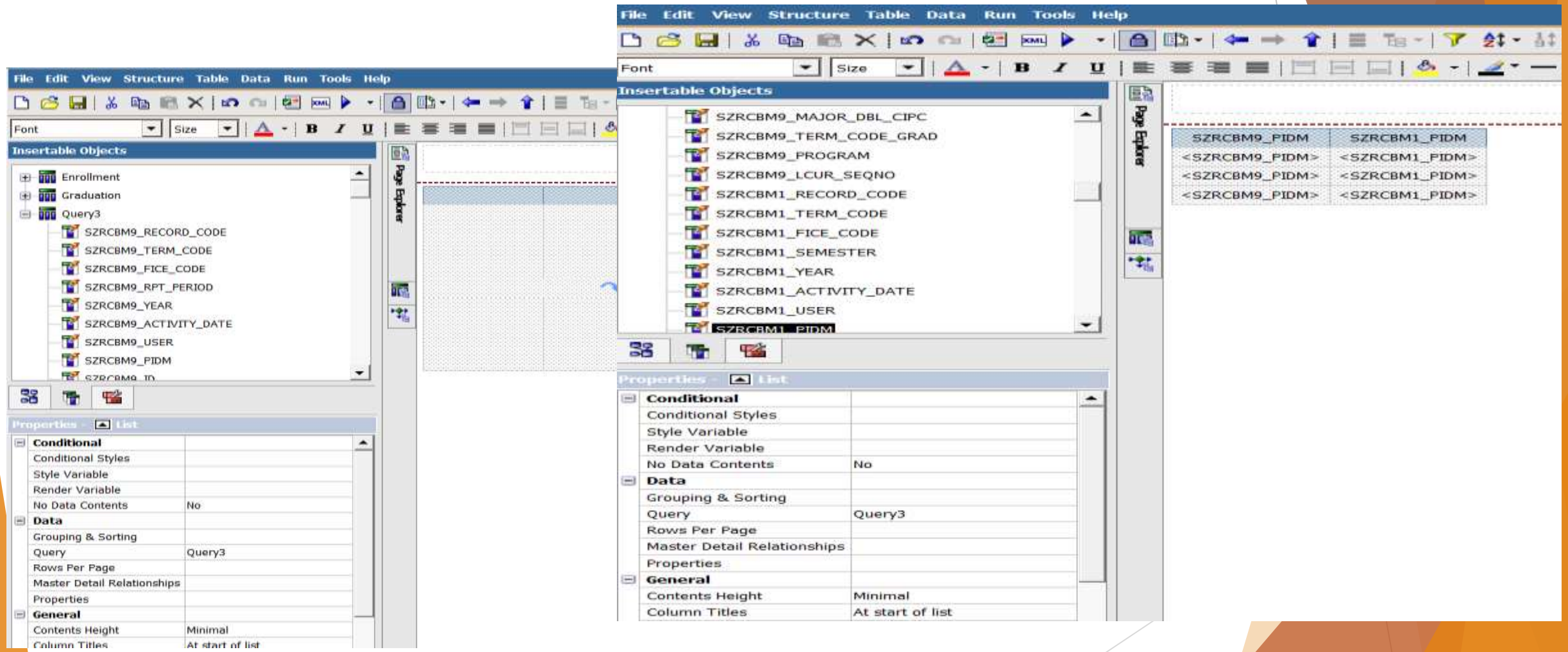
Writing the Cognos Report

- Using SQL query data directly from ODS
  - Back to query – see the variables in the Query Item



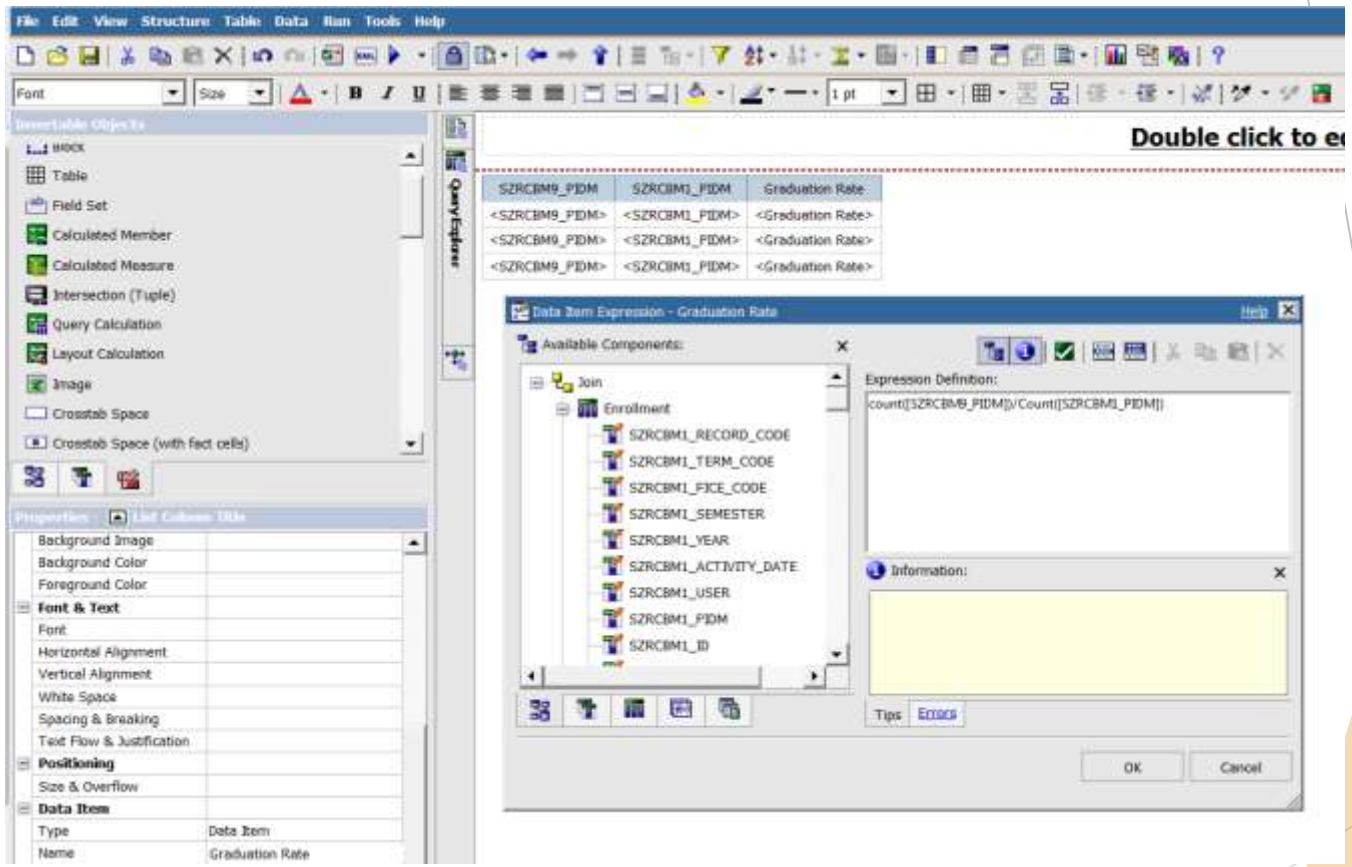
Writing the Cognos Report – Package Not Available

- Report Page – select the variables needed for creating the report



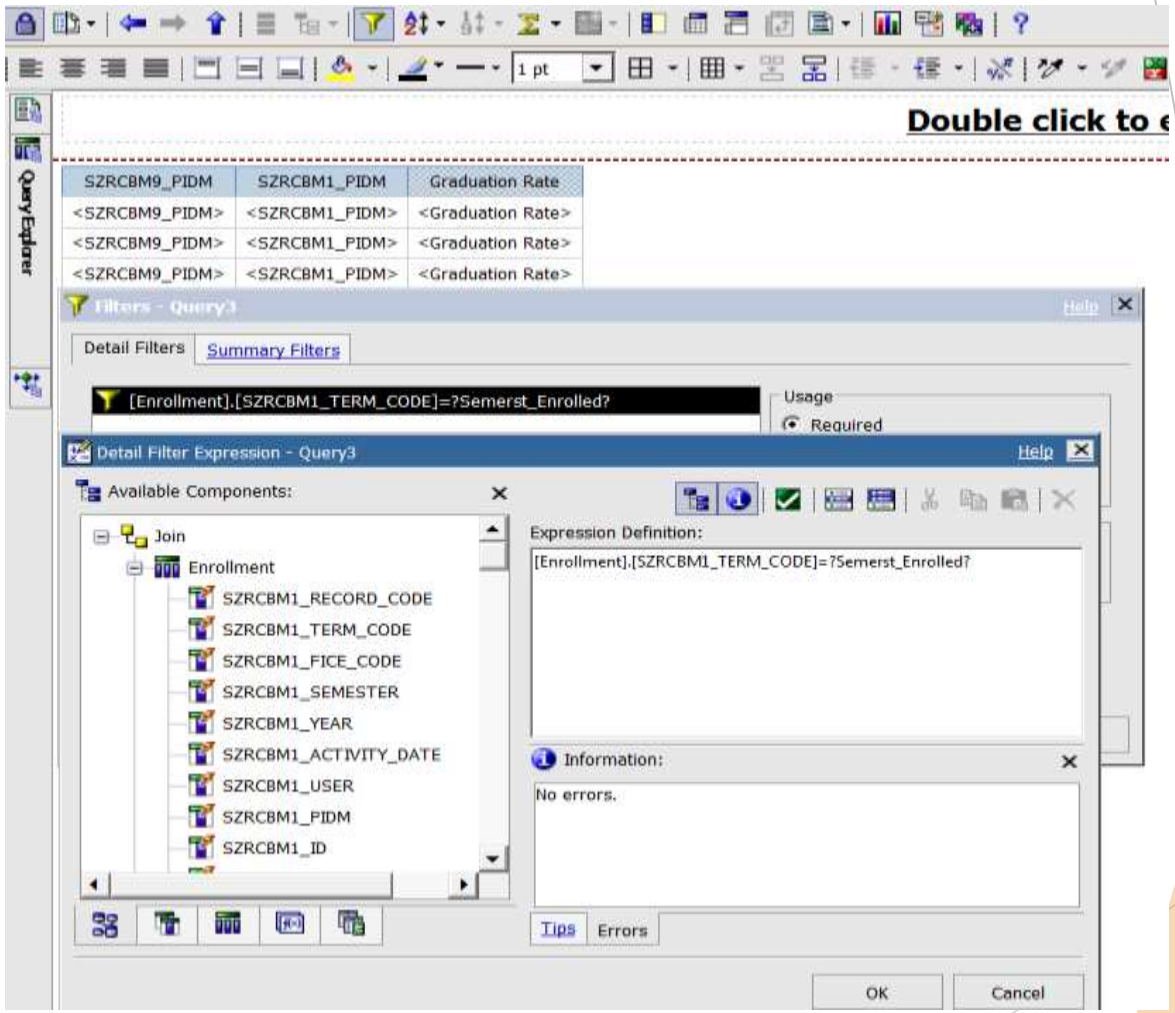
Writing the Cognos Report - Calculations

- Calculated Column
  - Toolbox, Query calculation
  - Common functions/Type the calculation
- Aggregation
  - Summarization of grouped items
  - Retention rate



Writing the Cognos Report

- Creating **Filters** - ? Term ?
- Creating **Prompt Page** – allows user to customize the information in a report for each run
- Creating a **Drill-Through** Report – links two or more reports containing related information
- Changing **Auto Group** & **Summarize**



Reviewing the Cognos Report

- Modify Report
  - Source Tab vs. Data Items Tab – Cutting vs. Deleting a column
    - Report change - the items from the source tab never change
- Turn Auto Aggregation Off
    - Multiple records for one unique ID are combined into one row
- Review and Testing
  - Tabular Data Check – Multi queries, check each query and each query join by running the report in View Tabular within Report Studio. (Data output will appear very much like the Results section in Brio). This will aid in finding data errors, filter problems, and join issues as you create the multi queries.

Tips

- Keep the Documentation of the Special Variables Used in the Report
  - Reporting on Schedule Offering or Section data, use Academic_Period and Course_Reference_Number for a unique offering
  - Graduation - ACADEMIC_OUTCOME, filter on ACADEMIC_PERIOD_GRADUATION instead of ACADEMIC_PERIOD
- Create Template – ensure a consistent look, standardize reports
  - Create consistent Header and Footer
  - Prompt Page – include Academic Year, Student Level, etc.
- Layout Component Reference – reusable; minimal maintenance, system changes to variables pulled from LCR are automatically updated and reflected in the reports that are built with LCR
- YouTube Tutorials
- Join Cognos Professional Groups

~ Questions ~

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