Report Writing Tools Evaluation

NYU Stern School of Business
Team:

- 4 student names
Presentation Outline

- Concepts
- Client Summary
- Architecture Overview
- Project Goals
- Functional Requirements
- Non-Functional Requirements
- Overview of Report Writing Tools
Concepts

• Relational Database
• Tables
• SQL
Relational Database

- All data is perceived by the user as a collection of tables (relations)
- Operators at user’s disposal generate new tables from the old
Tables

- A row of column headings
- Zero or more rows of data values
- Each data row contains exactly one scalar value for each column
- Primary Key (Optional)

<table>
<thead>
<tr>
<th>STUDENT</th>
<th>SSN</th>
<th>Last Name</th>
<th>First Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>123-45-6789</td>
<td>Smith</td>
<td>John</td>
</tr>
<tr>
<td></td>
<td>456-78-9101</td>
<td>Doe</td>
<td>Jane</td>
</tr>
</tbody>
</table>
SQL

- Structured Query Language
- Used to formulate relational operations
- In other words: language that manipulates data in table form
Client Summary

- Stern maintains several legacy databases to store information related to:
  - Admissions
  - Students
  - Alumnae
  - Executive MBA students
  - Office of Career Development
  - others
Architecture Overview

Admissions DB
SQL 6.4
Contains Application information, recommenders and such.

AIS (Administration Information System)
Ingress 2
List of all students since 1989. Contains course information, enrollment, grades, bio, financials, Register, Bursar, Advising data and such

OCD (Office of Career Development)
4GL

DOTS
Alumnae DB
SQL 7.0

Ex MBA

Ex Devel
My SQL

HR DB
Access
Contains information about Stern administrators and staff
Current Issues

• Database access is not uniform. Example: Admissions reports vs AIS reports

• New custom reports take a lot of programming effort

• Use of hard copy reports and subsequent typing into a different system

• Changes in business rules result in a need to rewrite queries
Why Report Writing Tools Evaluation Project ??

• Our customer needs/wants :
  – Achieve higher degrees of integration of databases
  – Establish a uniform way of reporting
  – Easier way to maintain business lagoc
Benefits of a Common Reporting Tool

• Extract, process and present information to end users faster

• Save time and money on training

• Provide high level integration of Stern databases
• Evaluate various reporting tools and make a recommendation to Stern
Scope

Certain issues lie outside the scope of this project:

• Creating an OLAP to manage data
• Giving staff data mining capabilities
Functional Requirements
Tool Must Be Able to Access Multiple Data Sources Simultaneously

• Some reports require joining data from several databases:

• Are there any Stern Alumnae (Alumnae DB) who were recommenders for a Stern applicant (Admissions DB) who can participate in a recruiting event (Office of Career Services DB) that I can contact in Merrill Lynch?
Use Case of Accessing a Single Database from Excel

- Run Excel Pivot Table Wizard
- Choose External Data Source option
- Select the database to connect to (SMS)
- Login to Database
- Chose needed fields from tables in the database
- Set up MS Query (either new or saved) to process relations between the fields
- Use Pivot table wizard to set up the report
- Use Excel for additional formatting
Tool Must Be Able to Join/Relate Data From Different Databases Based on a Primary Key

• Example: I would like to see the SAT-Math scores of all people who got an A- or better in the projects course

• But they are in different databases: Admissions and AIS

• Their SSN is the same in either case
### Admissions DB (D1)

<table>
<thead>
<tr>
<th>SSN</th>
<th>Last Name</th>
<th>First Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>123-45-6789</td>
<td>Smith</td>
<td>John</td>
</tr>
<tr>
<td>555-33-6677</td>
<td>Goldberg</td>
<td>Arthur</td>
</tr>
<tr>
<td>456-78-9101</td>
<td>Doe</td>
<td>Jane</td>
</tr>
</tbody>
</table>

### HS GPA

<table>
<thead>
<tr>
<th>SSN</th>
<th>GPA</th>
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<tbody>
<tr>
<td>123-45-6789</td>
<td>3.7</td>
</tr>
<tr>
<td>555-33-6677</td>
<td>3.6</td>
</tr>
<tr>
<td>456-78-9101</td>
<td>3.8</td>
</tr>
</tbody>
</table>

### SAT

<table>
<thead>
<tr>
<th>SSN</th>
<th>V</th>
<th>M</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>123-45-6789</td>
<td>520</td>
<td>640</td>
<td>1160</td>
</tr>
<tr>
<td>555-33-6677</td>
<td>600</td>
<td>720</td>
<td>1320</td>
</tr>
<tr>
<td>456-78-9101</td>
<td>650</td>
<td>550</td>
<td>1200</td>
</tr>
</tbody>
</table>

### AIS Database (D2)

### STUDENT

<table>
<thead>
<tr>
<th>SSN</th>
<th>Last Name</th>
<th>First Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>123-45-6789</td>
<td>Smith</td>
<td>John</td>
</tr>
<tr>
<td>555-33-6677</td>
<td>Goldberg</td>
<td>Arthur</td>
</tr>
<tr>
<td>456-78-9101</td>
<td>Doe</td>
<td>Jane</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SSN</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>123-45-6789</td>
<td>B-</td>
</tr>
<tr>
<td>555-33-6677</td>
<td>A</td>
</tr>
<tr>
<td>456-78-9101</td>
<td>A-</td>
</tr>
</tbody>
</table>

### SQL

```sql
SELECT D1.Applicant.SSN AS SSN, D1.Applicant.Last_Name AS Last_Name, D1.Applicant.First_Name AS First_Name, D2.G3812.Grade AS Grade, D1.SAT.M
FROM D1, D2
WHERE D1.Applicant.SSN = D2.SSN
```

### Custom Report

<table>
<thead>
<tr>
<th>SSN</th>
<th>D1.Applicant.Last_Name</th>
<th>D1.Applicant.First_Name</th>
<th>D2.G3812.Grade</th>
<th>D1.SAT.M</th>
</tr>
</thead>
<tbody>
<tr>
<td>555-33-6677</td>
<td>Goldberg</td>
<td>Arthur</td>
<td>A</td>
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<tr>
<td>456-78-9101</td>
<td>Doe</td>
<td>Jane</td>
<td>A-</td>
<td>550</td>
</tr>
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</table>
Tool Must Encapsulate Business Logic

• Currently business logic is scattered in all layers

• Example of a business rule: Admit all applicant whose SAT scores are in the top 5%

• Reports are hard to maintain when business rules change

• Hypothetical example: besides accepted, declined, and waitlisted, add category “priority waitlisted”
Tool Should Make It Easy to Migrate Existing Reports to a New Tool

• If Stern accepts our report writing tool recommendation and deploys the tool, Stern will probably want to migrate most of existing reports to a new tool

• Should try to minimize migration time
Security

• Our tool should be able to connect to multiple databases using different login names and passwords
Non Functional Requirements

• Tool must be able to extract data from legacy RDBMS such as SQL Server 6.4/7.0 and Ingress (*)

• Reports must be generated in real-time, 2-3 minutes at most

• Tools should potentially be deployable on the Web
Report Writing Tools That Were Researched

- Microsoft Access
- Microsoft Visual Studio
- Excel
- Crystal Report
- Brio Reports
- Cognos Impromtu
- Acumen
- ClearPath
# Database Connectivity Matrix

<table>
<thead>
<tr>
<th></th>
<th>Native SQL Server connectivity</th>
<th>Non-native SQL Server connectivity</th>
<th>Native Ingres connectivity</th>
<th>Non-native Ingres connectivity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MS Access</strong></td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
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<tr>
<td><strong>MS .NET</strong></td>
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<td><strong>Visual Studio</strong></td>
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<td>X</td>
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<tr>
<td><strong>Excel</strong></td>
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<td>X</td>
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<td>X</td>
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<tr>
<td><strong>Crystal Report</strong></td>
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<tr>
<td><strong>Brio Reports</strong></td>
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<td></td>
<td>X</td>
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<tr>
<td><strong>Cognos Impromptu</strong></td>
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<tr>
<td><strong>Acumen</strong></td>
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</tr>
<tr>
<td><strong>ClearPath</strong></td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Report Writing Tools
Project Status

• Requirements gathering  100 % complete
• Requirements analysis  100 % complete
• Transition report      60 % complete
Thanks for Listening!

Questions, Comments, Praise?