

**Topics in Information and Communications Technology:
Business Intelligence**

Graduate School of Management
Seoul National University
Spring 2010 Course Syllabus

Professor Salvatore T. March
Owen Graduate School of Management
Vanderbilt University
e-mail: Sal.March@Owen.Vanderbilt.edu
URL: <http://SalMarch.com>
course URL: <http://SalMarch.com/ICT>

Overview

Organizations rely on computer-based information systems for capturing, analyzing, and distributing the information required to develop, implement, and evaluate corporate strategies in all functional areas. Managing data as a corporate resource requires a deep understanding of business processes and of the underlying structure of the data needed to support them. Business intelligence refers to the process of capturing and storing needed data in a data warehouse and utilizing appropriate tools that enable that data to be transformed into useful information to support managerial decision-making. The focus of this course is on concepts central to the management of data resources and the development of business intelligence capabilities. There is a mixture of theoretical and practical topics including case studies and a significant hands-on component. Microsoft Access, Microsoft SQL Server, and Teradata are used as examples of relational database and data warehousing technologies. Microsoft Excel and Microstrategy products are used as examples of business intelligence technologies. No prior knowledge of database or business intelligence technologies is assumed.

Course Objectives

At the end of this course the student should be able to effectively develop, manage, integrate, and use corporate information resources on local computers and over the Internet. Specifically, the student should be able to:

1. Obtain data from an existing Relational Database using SQL and report generation tools;
2. Interpret, develop, and evaluate process and data models used to support business applications and business intelligence applications;
3. Implement a Relational Database to support business operations;
4. Implement a Relational Data Warehouse to support business intelligence reporting;
5. Construct multi-dimensional data cubes and use pivot table and pivot chart tools to analyze them;

The course is organized into two parallel tracks. One is theoretical, methodologically oriented. It deals with representation formalisms and techniques. In it we will cover basic systems concepts, information requirements determination, process and data modeling formalisms and techniques, relational database concepts, data warehousing and Internet communication concepts, and business intelligence projects. The other is "tool" oriented. In it we will cover SQL, process and data modeling tools, visual programming, multidimensional databases, and Web access to data resources. Microsoft Access and SQL Server will be used to illustrate relational database management systems, Silverrun RDM will be used to illustrate CASE tools and Microsoft Access will be used to illustrate an integrated development environment and visual programming. Data cubes and pivot tables in Access and Excel will be used to illustrate data warehousing and business intelligence tools.

Course Materials

Case Study

McAfee, A., *Business Intelligence Software at SYSCO*, Harvard Business School, 5-604-103, June 14, 2004 (will be distributed in class).

All other required materials are available over the Internet.

Microsoft SQL Server Reference Web Site [http://msdn.microsoft.com/en-us/library/ms189826\(SQL.90\).aspx](http://msdn.microsoft.com/en-us/library/ms189826(SQL.90).aspx) (select SQL Server Language Reference and the Transact-SQL Reference) See also Microsoft searchable knowledgebase at <http://support.microsoft.com>.

WebSQL Web Site <http://Owen.WebSQL.org>

Assignments, example applications, tutorials, PowerPoint presentations, readings, and additional readings and case study materials are available on the course Web site <http://SalMarch.com/ICT> (username is SNU; password is ICT*2010; both are case sensitive).

Course Requirements

Students are expected to do readings prior to the class in which that material will be discussed. Assignments are due *at the beginning of the class* specified on the class schedule below. Solutions will be discussed in class on the due date; hence late submissions will not be accepted. Each assignment must be completed individually. Grades will be based on the following:

1.	Computer Exercises: Four computer exercises reinforce the basic database and development concepts. These use a sample accounting information system, Microsoft Access, and SQL Server over the Web. (35 points)
2.	Data Modeling Exercises: These provide experience data modeling tools and techniques on well-defined situations including an operational database and a data warehouse. They use a CASE tool called Silverrun and Microsoft Access. (40 points)
3.	Final Examination: An open-book, open-computer examination will be given in the last class. (25 points)

Class Schedule

Class 1	<p>Introduction Information Systems Architecture, Overview of the System Development Process, Core Information System Applications</p> <p>Relational Database and SQL Relational Database Definitions, Single Table (Select) Retrieval Queries</p> <p>Readings: SQL Tutorial Sections 0, 1, and 2. Use Access Help and the WebSQL Site as needed for SQL syntax (Select, Where, Order By, Between, and Aliases)</p> <p>Assignment: CE-1 Accounting IS Use (due class 2)</p>
Class 2	<p>Business Intelligence Concepts SYSCO Case Study Introduction and Discussion; ERP software and database requirements; Data Warehouses; Business Intelligence Interface.</p> <p>Readings: Business Intelligence Software at SYSCO Case Study (Background)</p> <p>Assignment: CE-2 SQL Queries and Reports 1 (due class 3)</p>
Class 3	<p>SQL Continued Data Aggregation: Group By Queries and Pivot Tables</p> <p>Readings: SQL Tutorial Section 3. Use Access Help and the WebSQL Site as needed for SQL Group By syntax. Use Access and Excel Help as needed for Pivot Tables.</p> <p>Reference: Business Intelligence Software at SYSCO (SQL interface to Data Warehouse)</p> <p>Assignment: CE-3 SQL Aggregation Queries (due class 4)</p>
Class 4	<p>Data Modeling Introduction Basic Concepts: Entities, Attributes, Relationships, and Constraints</p> <p>Readings: March (Data Modeling), Silverrun RDM Tutorial</p> <p>Assignment: DME-1 Silverrun RDM Data Model (due class 5)</p>
Class 5	<p>SQL Revisited Multi-Table Queries: Join, Union, Nested Data Maintenance Queries: Insert, Delete, Update</p> <p>Readings: SQL Tutorial Sections 4 and 5. Use Access Help and the WebSQL Site as needed for SQL syntax (Join, Union, Nested Queries, Insert, Update, Delete, Join, SQL Functions, and Select Into)</p> <p>Assignment: CE-4 SQL Join Queries (due class 7)</p>
Class 6	<p>Business Intelligence Applications Data Warehouse Schemas: Operational and Star Schemas Pivot Tables and Charts, Executive Dashboards</p> <p>Readings: Wetherbe (Executive Information Requirements), Houghton, et al. (Vigilant Information Systems)</p>

	<p>Moody and Kortink (Dimensional Data Modeling)</p> <p>Reference: Business Intelligence Software at SYSCO (OLAP Queries and Data Cubes)</p> <p>Assignment: DME-2 Star Schema Model and BI Interface (due class 8)</p>
Class 7	<p>Business Systems</p> <p>Transaction Processing in the Revenue Cycle, General Ledger Integration, Business Intelligence Analysis and Reporting</p> <p>Review Process Models, YBCL Case Study Introduction</p> <p>Readings: YBCL Case</p> <p>Assignment: DME- 3 YBCL Data Model (due class 9)</p>
Class 8	<p>Business Systems Revisited and Web Systems</p> <p>Review Revenue Cycle</p> <p>Web Storefront - Registration, Profile, Shopping, Shopping Cart, Checkout, Credit Card Processing, Order Tracking</p> <p>Web Fulfillment - Shipping, Sales Analysis, Product Management</p>
Class 9	<p>YBCL Case Analysis, Prototype Demonstration, and Course Review</p>
Class 10	<p>Final Exam</p>