



COURSE SYLLABUS

Business Intelligence

Instructor: *Malov Andrew, Master of Computer Sciences, Assistant ,aomalov@mail.ru*

Organization of the course

Program	Bachelor
Year	XXX year
Course status	Elective
Workload	6 ECTS, 45 hours of classes
Prerequisites	General management, economic theory, information technology fundamentals, networks and relational databases
Teaching methods	The course format combines lectures, individual class assignments, computer labs and will be based on interactive teaching style with intensive student participation

Course abstract

Nowadays business are run in global environments: operations and financial transactions are managed 24 hours a day all over the world. To this end the role of IT could not be underestimated any longer. A modern IT Director becomes a fully powered company Officer. IT is the major facilitator for business efficiency and development. High level competence and professional communication between IT and general management is a key to successful deployment and utilization of state-of-art IT technologies.

Course is intended to introduce current IT trends to future managers and develop practical skills in the field of decision support technologies.

First part of the course classifies the types of enterprise information systems. These types of information systems provide solid foundation for building intelligent solutions over enormous data volumes they possess.

Second part of the course defines Business Intelligence as an enterprise wide process used in strategic and everyday decision making.

Third part of the course develops practical skills in building and deploying a complete BI solution. This part will be held in computer class, specially equipped for the course with latest BI software tools by Microsoft. Duration of labs is preliminarily considered as one third of the course' timing.

Course objectives

Course aims to provide students with solid understanding of IT role at the enterprise. An upgraded level of so called IT-literacy will help managers to collaborate with IT staff in an efficient manner. Modern information systems dedicated for both data collection and knowledge discovery will provide management with an easy and understandable toolkit for online operations control over a scaling business in a diverse environment.

Key skills developed by students

Course develops in students the so called “strategic IT thinking”. Course materials and knowledge will assist in proper communication with IT staff. Practical skills in Business Intelligence and Decision Support will help to utilize the most current software products in everyday decision making.

Establishing a KPI and BSC structure powered by BI platform and integrated with enterprise level information systems in terms of data collection and aggregation will add a major value to managerial processes all throughout the company.

Course content

All the issues covered within the course are arranged into 10 themes.

Introduction. The need for IT in the organization
IT toolkit as a new driver for business efficiency. Traditional examples of doing business
opposed to digital economy. Benefits of deploying IT solutions: tangible and intangible.

Part 1. Topic 1. Enterprise wide Applications classification
Supply chain automation essentials. Resource planning. MRP, ERP, CSRP. CRM. Integration
and global issues.

Part 2. Topic 1. Business Intelligence Fundamentals.
Historical review. BI solution architecture. BI process. Deployment issues

Part 2. Topic 2. Datawarehousing concepts.
Transactional Information Systems and relational databases opposed to Analytical Information
systems – addressing the needs for decision making. Choosing a DW architecture. Data
extraction and upload. Data integration models. Usage of metadata. (*Incl. works in computer
classes*)

Part 2. Topic 3. Reporting concepts.
Deploying an enterprise wide reporting solution. (*Incl. works in computer classes*)

Part 3. Topic 1. OLAP.
Building up multidimensional cubes. Non-relational and denormalized databases physical
design. Defining measures and dimensions. Introducing ad-hoc reporting. (*Incl. works in
computer classes*)

Part 3. Topic 2. Data Mining
KDD (Knowledge discovery from databases) process definition. Types of interesting and
potentially useful output patterns, common algorithms. Use cases in different industries and
knowledge domains. (*Incl. works in computer classes*)

Part 3. Topic 3. KPI and Balanced Scorecards
A modern paradigm for strategic management. A key to long term success and business
development. Common steps for implementing a BSC. Simple toolkit for data engineer and
business analyst: take the most of BI at your enterprise and make it simple and convincing. (*Incl.
works in computer classes*)

Plan of classes

Introduction. Role of IT Technologies in modern enterprise

Class 1.	
Week Auditorium	<p>Key points:</p> <ul style="list-style-type: none">• Business and Society in the new Information Era• The role of IT in facilitating long term successful operation of a company• Intangible assets share of a company's aggregated value <p>Learning outcomes:</p> <ul style="list-style-type: none">• Understanding of role of IT in contemporary organizations• Knowledge of the key benefits the information era brings to businesses <p>Assignments after class: # Home reading: Required reading #1, ch. 1</p>

Topic 1.1 Enterprise Information Systems

Class 2-4.	
Week Auditorium	<p>Key points:</p> <ul style="list-style-type: none">• Supply Chain Management tasks. Value generation chain. Resource Planning• Different classes of EIS: MRP, SCM, CRM. Top vendors comparison, market analysis.• Assessing infrastructure for EIS deployment. Integration issues. New paradigm SAAS/S+S. "On-demand" application providers <p>Learning outcomes:</p> <ul style="list-style-type: none">• Understanding of key automation tasks accomplished by different EIS• High level knowledge of EIS market <p>Assignments after class: # Home reading: Required reading #1, ch. 6.3-7.5, 14.4</p>

Topic 2.1 Introduction to Business Analytics

Class 5.	
Week Auditorium	<p>Key points:</p> <ul style="list-style-type: none">• BI: technology evolution• BI platform architecture• BI process and players profile• BI deployment issues <p>Learning outcomes:</p> <ul style="list-style-type: none">• Understanding the need for BI in most competitive markets• Knowledge of continuous improvement routines introduced by BI process <p>Assignments after class:</p>

Home reading: Required reading #1, ch. 10.1, 10.3, 11.1-11.4

Topic 2.2 Introduction to Data Warehousing

Class 6.	
Week Auditorium /computer class (to be announced later)	<p>Key points:</p> <ul style="list-style-type: none">• Transactional vs. Analytical Information Systems• DW concepts• DW architecture <p>Learning outcomes:</p> <ul style="list-style-type: none">• Understanding the difference between “data collecting” and “data providing” information systems• Knowledge of main warehousing models and strategies <p>Assignments after class: # Home reading: Required reading #1, ch. 10.2</p>

Class 7.	
Week Auditorium /computer class (to be announced later)	<p>Key points:</p> <ul style="list-style-type: none">• Loading data into the datawarehouse• Modern Integration Techniques• Use of Metadata <p>Learning outcomes:</p> <ul style="list-style-type: none">• Understanding of the database concepts: denormalization, relational data, data sufficiency• Capability to integrate data from different sources into a stable uniform location

Topic 2.3 Introduction to Reporting

Class 8.	
Week Auditorium /computer class (to be announced later)	<p>Key points:</p> <ul style="list-style-type: none">• Report generation common issues• Reporting user profiles• Choosing the appropriate data source for reporting• Establishing a reporting solution at the enterprise: kernel process <p>Learning outcomes:</p> <ul style="list-style-type: none">• Understanding the need for data in enterprise reporting• Knowledge of reporting tasks differentiation• Capability to integrate data from different sources into a stable uniform location

Topic 3.1 Introduction to OLAP

Class 9-10.	
Week	Key points:

<p>Auditorium /computer class (to be announced later)</p>	<ul style="list-style-type: none"> • Dynamic Decision Support Systems • OLAP principles • Codd criteria list for OLAP • FASMI test <p>Learning outcomes:</p> <ul style="list-style-type: none"> • Understanding the need for ad-hoc reporting • Knowledge of aggregation techniques and olap principles • Capability to design, deploy and explore a multidimensional cube
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Class 11.	
<p>Week</p> <p>Auditorium /computer class (to be announced later)</p>	<p>Key points:</p> <ul style="list-style-type: none"> • OLAP products and vendors overview <p>Learning outcomes:</p> <ul style="list-style-type: none"> • Capability to query and partition cubes, manage data access security • Deeper understanding of olap operations • Knowledge of key players on the OLAP market

Topic 3.2 Introduction to Data Mining

Class 12.	
<p>Week</p> <p>Auditorium /computer class (to be announced later)</p>	<p>Key points:</p> <ul style="list-style-type: none"> • KDD – concepts and definitions • Knowledge discovery tasks classification • Different fields and businesses for applying modern DM toolkit • CRISP DM standard <p>Learning outcomes:</p> <ul style="list-style-type: none"> • Understanding the key applications of DM in today’s businesses • Knowledge of DM processes and standards <p>Assignments after class:</p> <p># Home reading: Required reading #1, ch. 10.4-10.5</p>

Topic 3.3 Key performance indicators and Balanced Scorecards

Class 13.	
<p>Week</p> <p>Auditorium /computer class (to be announced later)</p>	<p>Key points:</p> <ul style="list-style-type: none"> • Extracting and using KPIs • Business Performance Management issues • Applying Balanced Scorecards for corporate strategy support and fulfillment <p>Learning outcomes:</p> <ul style="list-style-type: none"> • Understanding the BI techniques development

	<ul style="list-style-type: none">• Knowledge of common BPM tasks and scorecarding practices• Capability to design and deploy KPI and BSC tools on a corporate intranet portal
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Office hours for individual consultations:

Andrew Malov, individual consultations by email aomalov@mail.ru , face-to-face consultations – by prior appointment

Calendar plan of current and final evaluation

Mid-term evaluation – submission of individual class assignments	XXX , by email
Announcement of mid-term evaluation results	Week XXX, date to be announced later
Pre-exam consultation:	To be announced at the end of semester
Exam:	XXX, 2009
Announcement of exam results:	To be announced at the end of semester

Evaluation system

- # Forms of current evaluation: individual class assignments. Grading is done on “passed/failed” basis and qualifies for GSOM mid-term assessment.
- # Form of final evaluation: written exam
- # Grading policy

Student’s work for the course will be assessed in 3 key aspects: success in lab works, regular coursework (including assignment completion and in-class activity) , knowledge of the course topics (exam). Exam is held as a written test based on all course issues and materials.

The final assessment is composed as follows:

1. Final exam – 50%
2. Regular coursework – 20%
3. Student lab work – 30%

Required reading

1. Information Technology for Management: Transforming Organizations in the Digital Economy (Hardcover) by Efraim Turban (Author), Dorothy Leidner (Author), Ephraim McLean (Author), James Wetherbe (Author)
2. Decision Support and Business Intelligence Systems (8th Edition) (Hardcover) by Efraim Turban (Author), Jay E. Aronson (Author), Ting-Peng Liang (Author), Ramesh Sharda (Author)

Optional reading

1. Data Mining, Second Edition, Second Edition : Concepts and Techniques (The Morgan Kaufmann Series in Data Management Systems) (The Morgan Kaufmann Series in Data Management Systems) (Hardcover) by Jiawei Han (Author), Micheline Kamber (Author) "This book is an introduction to what come to known as data mining and knowledge spective, where emphasis is placed on basic data mining concepts..." (more)
2. Building the Data Warehouse (Paperback) by W. H. Inmon (Author) "We are told that the hieroglyphics in Egypt are primarily the work of an accountant declaring how much grain is owed the Pharaoh..." (more)
3. P.Bradley, U.Fayyad, O.Mangasarian. (1998), Data Mining: Overview and Optimization Opportunity. [Http://www.research.microsoft.com/datamine/](http://www.research.microsoft.com/datamine/).
4. <http://www.cs.uregina.ca/~dbd/cs831/notes/ml/dtrees/c4.5/tutorial.html>
5. Codd E. F., Codd S. B., Salley C. T. Providing OLAP (On-Line Analytical Processing) to User-Analysts: An IT Mandate. - E. F. Codd & Associates, 1993.
6. U.M.Fayyad, G.Piatetsky-Shapiro, P.Smyth. (1995), From Data Mining to Knowledge Discovery: An Overview. In "Advances in Knowledge Discovery and Data Mining" (Eds. U.M.Fayyad, G.Piatetsky-Shapiro, P.Smyth), Cambridge, Mass: MIT Press, pp. 1-34.