Redesigning Data System Technology Curricula in the Big Data World

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Dr. Elena Gortcheva, Program Chair for MSc
Data Systems Technology, UMUC
Presentation Outline

Challenges
Phase I: Transition
Phase II: Complete Model
Students Profile

- working adults, military
- mid-career professionals
- workforce-related degree programs
- mostly online courses
- open-admissions university
Marketing Research

Bureau of Labor Statistics (O*Net) Findings: Top detailed occupations - 01/01/2012 - 12/31/2012

identified the top ten skills: SQL, Oracle, Database Administration, Data Warehousing, Data Analysis, Business Intelligence, Business Process, Data Management, SQL Server, ETL
Big Data: Paradigm shift

- Shortage in business analytics skills – new MSc program in Business Analytics

- Shortage in big data modeler as well as data scientist – redeveloping existing MSc in Database System Technology program
MSc in Database System Technology program

• Started in fall 2007 as a part of Information Technology curricula
• Focuses on the design, development, and management of data technology
• The curriculum covers distributed data bases, data warehousing and data mining.
• The goal of the specialization is to provide students with a practical understanding of the principles of database security, database administration
• The program should embrace emerging technology in the IT field
Challenges

• Too many new technology in IT/databases
• What new skills?
• What are the conceptual foundations?
• Theory vs Practical skills???
• Can we teach everything?
• How we measure students’ success?
• How we measure quality?
A high-quality academic program for Data Professionals has to address real workforce and industry needs in the realm of the emerging Big Data technology. Curricula can be kept current only by having direct collaboration with industry
Preparing Data Professional

- expert input from the advisory board
- external reviewers
- stakeholders
- survey of the IT area
- innovation

The curriculum was designed on what emerged as the workforce needs of the industry and evolved to Master of Science in Data System Technology.
Preparing Data Professional

Emphasis - moving technology from the laboratory to the realm of business development.

Data architect, Database manager, Data modeler, Database developer, Data warehouse manager, Business intelligence analyst, Data mining specialist, Database administrator, Data security specialist, Chief information officer, Chief Data officer....
Phase I – existing courses content update

• Applying emerging tools and methods in the growing amount of structured and unstructured data
• Data Warehouse Technology: new techniques for unstructured data (document data warehouse, taxonomy and ontology)
• Advanced database: NoSQL
Faculty - active experts in industry and/or higher education, providing rich real world expertise in the subject matter.

Lockheed Martin
SAIC
MITRE
Booz Allen Hamilton
NASA
NIH
Department of Education
Innovative Content - series of Webinars on Big Data

• Students have direct exchange with world-renowned experts in the Big Data field.

• Webinars were recorded hold and as reserved e-learning module by the UMUC library; used in a number of Information Technology classes and all DBST courses.

• Recordings contain significant amount of original content to supplement the course readings.

• Students satisfaction - positively impacted student learning outcomes.
Applied curriculum reflecting the industry needs

- Course Projects - on real industry needs

- Data Mining research project: students identify real data set and extract useful patterns and/or predict certain events

- Capstone Project (TCP). TCP encompass the knowledge acquired during the whole program. Students apply the knowledge, skills, and tools needed to be successful as Data Professional
Virtual Lab
Phase II – developing a competence based model

• Employers and students are part of the “ecosystem” of our programs, making sure programs are up to date and students are prepared to be successful in the profession.
• For employers, employees who have abilities that are relevant today and tomorrow.
• Portfolio of learning opportunities/paths so that students can get the education they need for the career they want.
• Focus on application (ability to do) means graduates who are prepared to meet challenges very quickly.
Questions???