

Revised ACM/AIS Undergraduate IS Curriculum Recommendation

Panel at AIS SIG-ED: IAIM (12/14/2008)

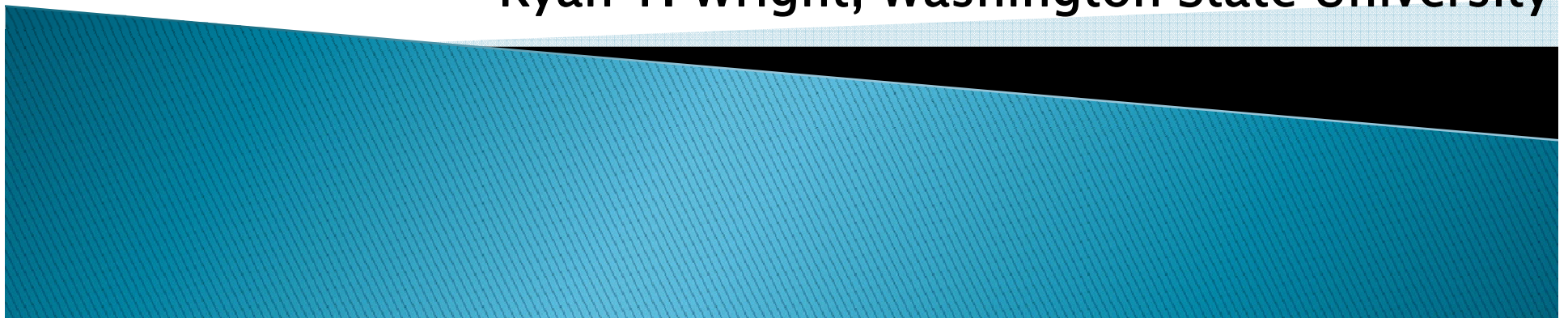
Panelists:

Heikki Topi, Bentley University

Janice Sipior, Villanova University

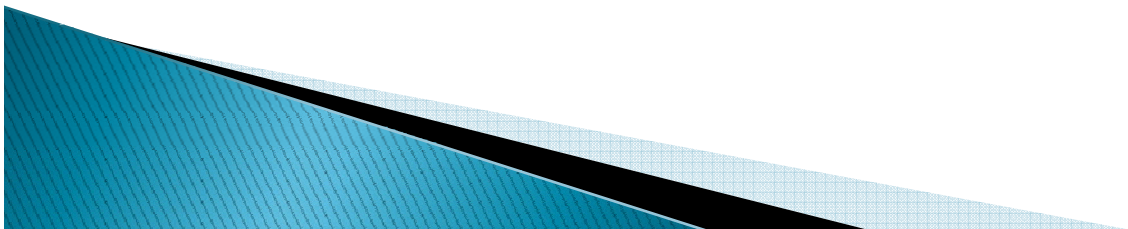
Joe Valacich, Washington State University

Ryan T. Wright, Washington State University



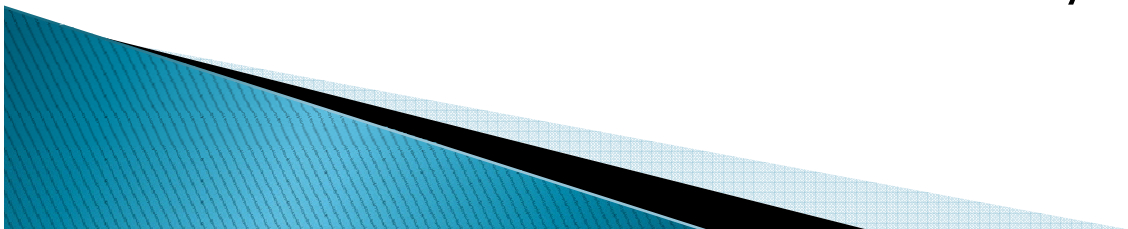
Agenda

- Introductions
- Status update
- Curriculum foundations
 - High-level organizational IS capabilities
 - Knowledge and skills of IS graduates
- Proposed new courses
- Differences between IS and IT disciplines
- Process schedule
- Conclusions and call to participate



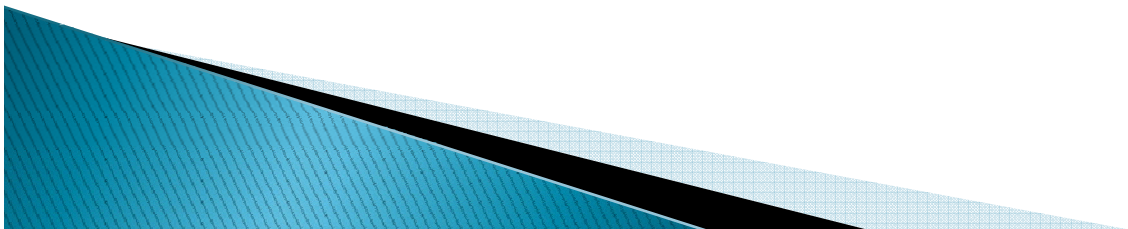
Motivation for Curriculum Revision

- Time: IS'97 was the latest significant undergraduate IS curriculum revision
 - Work done mostly in mid-1990s
- Major contextual changes
 - Globally distributed development sourced through complex arrangements
 - Web technologies and approaches
 - Service-oriented architecture; web services; cloud computing
 - Packaged software & ERP; decreasing focus on customized development by companies
 - Ubiquitous, mobile computing
 - Standardized approach to IT service management; ITIL/COBIT, etc.
- Enrollment crisis in IS and computing in general
- Clarify the identity of IS; comparing and contrasting IS and IT
- Getting the IS community involved as broadly as possible
- Making the curriculum more globally useful
- In many contexts, a reduced number of courses in the major
- Financial crisis → need for flexibility



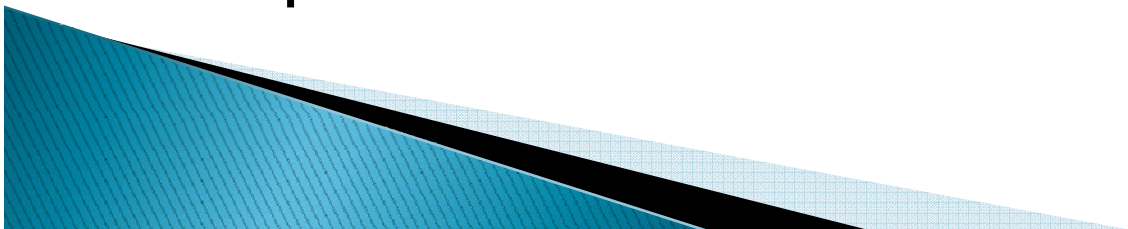
Project History

- ▶ Launched in Spring 2007
- ▶ Early realization that broad community involvement is both highly desirable and technically possible
- ▶ Development of a wiki environment designed for IS curriculum work
- ▶ Significant design changes proposed
- ▶ Major presentations at AMCIS 2007, AIS-SIGED 2007, ECIS 2008, and AMCIS 2008
- ▶ Reports to the IS community in Fall 2007 and Fall 2008 published in the Communications of the AIS



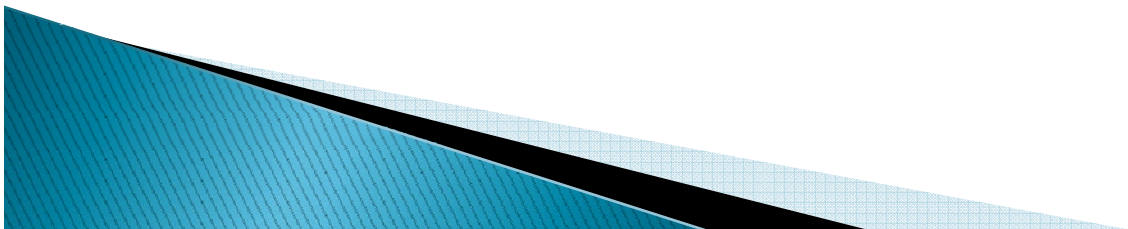
Key Elements of the Revision

- Reaching beyond business schools
- Curriculum structure: core vs. career track electives
- Using Web 2.0 technologies for curriculum work; community-driven curriculum development
- Encompassing the global perspective and encouraging global participation
- Thorough re-evaluation of the outcome expectations



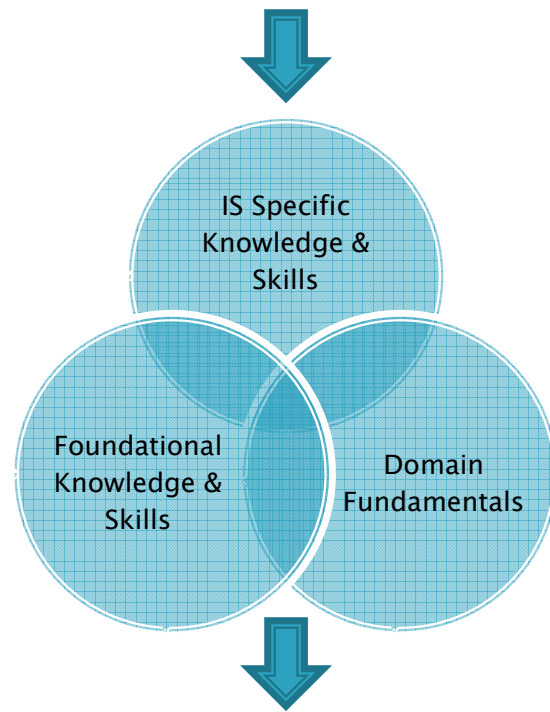
Recent Actions

- ▶ Restructuring the work so that the curriculum is clearly derived from high-level organizational needs and an improved understanding of graduate capabilities
- ▶ Explicitly separating *IS-specific Knowledge & Skills* from *Foundational Knowledge & Skills* and *Domain Fundamentals*
- ▶ Link the curriculum content and structure to graduate capabilities in a well-defined and transparent way
- ▶ Re-evaluating the use of the wiki
- ▶ Development of a set of new course descriptions
- ▶ Work on the final document



Overall Structure of the Basic Concepts

High-level IS Capabilities



Curriculum topics selected from a body of knowledge and delivered through courses

High-Level IS Capabilities

- ▶ Driven by organizational needs
- ▶ More abstract and stable than knowledge and skills
- ▶ Specify the general level expectations for IS graduates

High-Level IS Capabilities

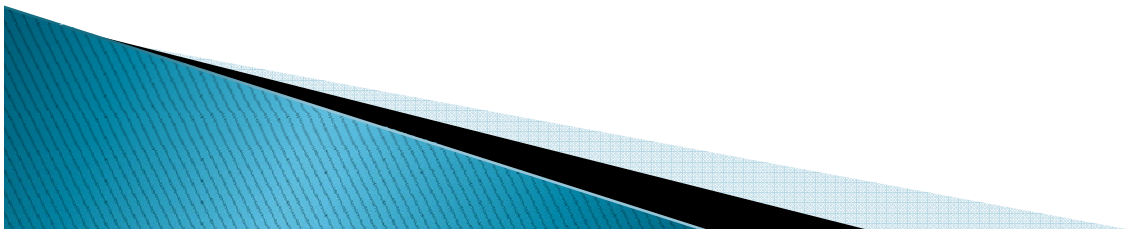
- ▶ Improving organizational processes
- ▶ Exploiting opportunities created by technology innovations
- ▶ Understanding and addressing information requirements
- ▶ Designing and managing enterprise architecture
- ▶ Identifying and evaluating solution and sourcing alternatives
- ▶ Securing data and infrastructure

Knowledge and Skills of IS Graduates

- ▶ Information Systems Specific Knowledge & Skills
 - Identifying and designing opportunities for organizational improvement
 - Analyzing trade-offs
 - Designing and implementing information systems solutions
 - Managing ongoing information technology operations
- ▶ Foundational Knowledge & Skills
 - Leadership and collaboration
 - Communication
 - Analytical and critical thinking
- ▶ Domain Fundamentals
 - Content depends on the domain context chosen for a program
 - Could be general business, a business specialty (such as finance), health care, government, non-profits, etc.

Discussion Questions

- ▶ Do the new outcome expectations adequately reflect your understanding of the needs of businesses?
- ▶ Are these expectations globally valid?
- ▶ This structure, in practice, suggests that Information Systems as a discipline is associated with multiple domains. Is this acceptable?



Current Topic Matrix

article discussion view source history

New Curriculum Structure and Content

As described in the [guiding principles](#), all Information Systems curricula must offer coverage of seven [core topics](#) related to Information Systems Specific Knowledge and Skills. In addition, the curricula cover a selection of [elective topics](#) depending on the [career tracks](#) that an institution has decided to offer, together with topics related to the development of foundational knowledge and [topics](#) and [domain knowledge](#). The career track list presented below is not intended to be exhaustive.

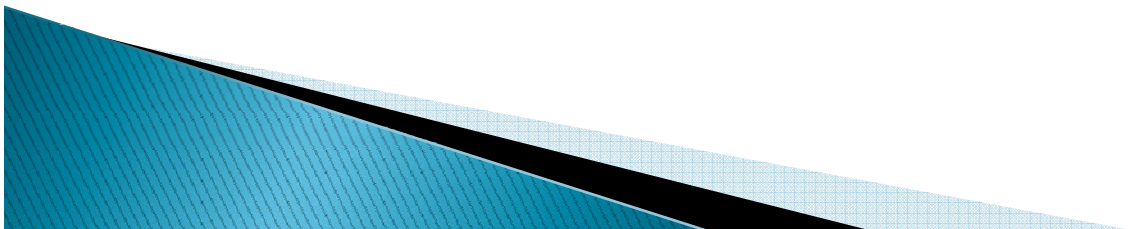
The matrix below represents the relative importance of each of the topics (both [core](#) and [elective](#)) and the [career tracks](#). It does not, however, include topics related to the foundational and domain knowledge.

Structure of the IS Model Curriculum: Information Systems specific topics

Career Track:	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	
Core IS Topics:																		A = Application Developer
Foundations and Role of IS	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	B = Business Analyst
Enterprise Architecture	○	●	○	○	○	●	○	○	○	○	●	○	○	○	○	○	○	C = Business Process Analyst
IS Strategy, Management and Acquisition	○	●	○	○	○	●	○	○	○	○	●	○	○	○	○	○	○	D = Database Administrator
Data & Information	●	○	○	●	●	○	○	○	○	○	○	○	○	○	○	○	○	E = Database Analyst
Systems Analysis & Design	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	F = e-Business Manager
IT Infrastructure	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	G = ERP Specialist
Project Management	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	H = Information Auditing and Compliance Specialist
																		I = IT Architect
																		J = IT Asset Manager
Elective IS Topics:																		K = IT Consultant
Application Development	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	L = IT Operations Manager
Business Process Management		●	●			○	○	○	○	○	○	○	○	○	○	○	○	M = IT Security and Risk Manager
Collaborative Computing						○									○		○	N = Network Administrator
Data Mining / Business Intelligence		●		●	●	○	○	○	○	○	○	○	○	○	○	○	○	O = Project Manager
Enterprise Systems		●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Q = Web Content Manager
Human-Computer Interaction	●					○	○					○					○	
Information Search and Retrieval		○		○	●									○			○	
IT Audit and Controls	○		●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
IT Security and Risk Management	○			○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Knowledge Management		●		○	○	○			○									
Social Informatics													○	○	○			

Proposed Core Courses

- ▶ Foundations of Information Systems
 - Prerequisite for others
- ▶ Enterprise Architecture
- ▶ Systems Analysis and Design
- ▶ Data and Information Management
- ▶ IT Infrastructure
- ▶ IS Project Management
- ▶ IS Strategy, Management, and Acquisition
 - Capstone at the end of the program



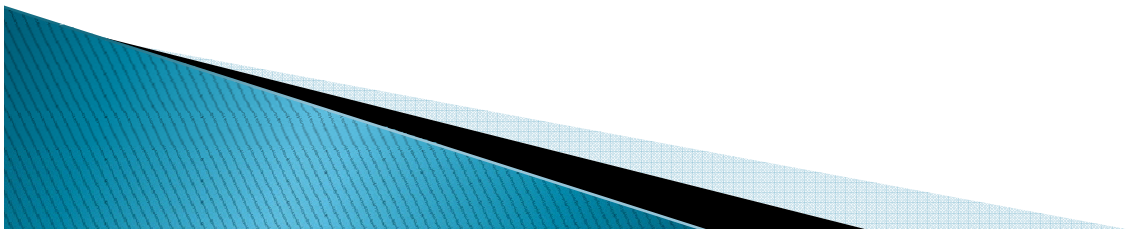
Some Proposed Elective Courses

- ▶ Application Development
 - ▶ Business Process Management
 - ▶ Enterprise Systems
 - ▶ Introduction to Human–Computer Interaction
 - ▶ IS Innovation and New Technologies
 - ▶ IT Audit and Controls
 - ▶ IT Security and Risk Management
- ▶ Note: Some schools may choose to use electives similar to those in CS and IT programs



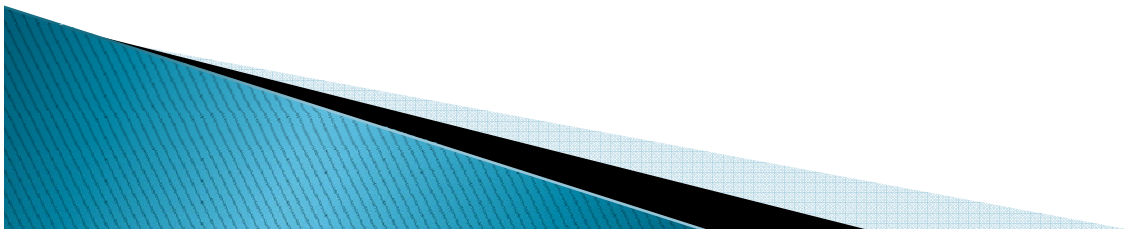
Structural Characteristics of an IS Degree

- ▶ Each school offering an IS degree should offer coverage of the *core topics* identified in this model curriculum
 - The extent of the coverage depends on the specific goals of each program and the local conditions
- ▶ The model curriculum acknowledges that the number of courses available for the major varies significantly (from as low as five to as high as 15 or even 20)
 - Those schools that have courses available are encouraged to develop in-depth electives
- ▶ The model curriculum does not specify a detailed sequencing for the courses
 - But this could be essential for technically advanced career-tracks



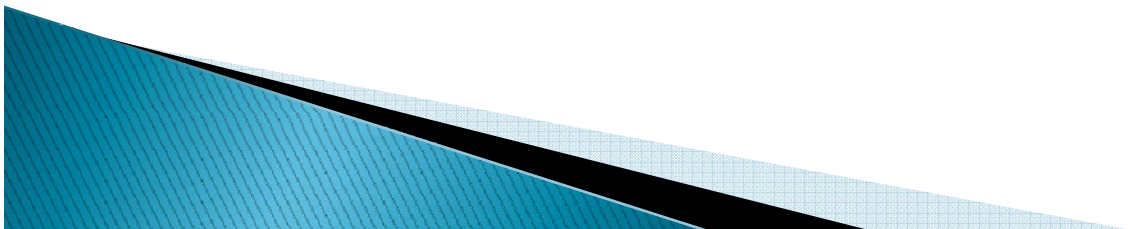
Discussion Questions

- ▶ Now when the course descriptions are available, do we still appear to have the right set of core courses?
- ▶ What defines the identity of an undergraduate IS degree?
- ▶ Should we specify core requirements in number of hours of instruction?
- ▶ Can we benefit from the work the IT education community has done?



IS and IT: Two Disciplines

- ▶ Joint ACM/AIS/IEEE-CS publication *Computing Curricula 2005* specifies five computing disciplines: CE, CS, IS, IT, and SE
- ▶ IT curriculum formally approved by both ACM Education Board and IEEE-CS in November 2008



CC2005 on Perceived Positioning of Computing Disciplines

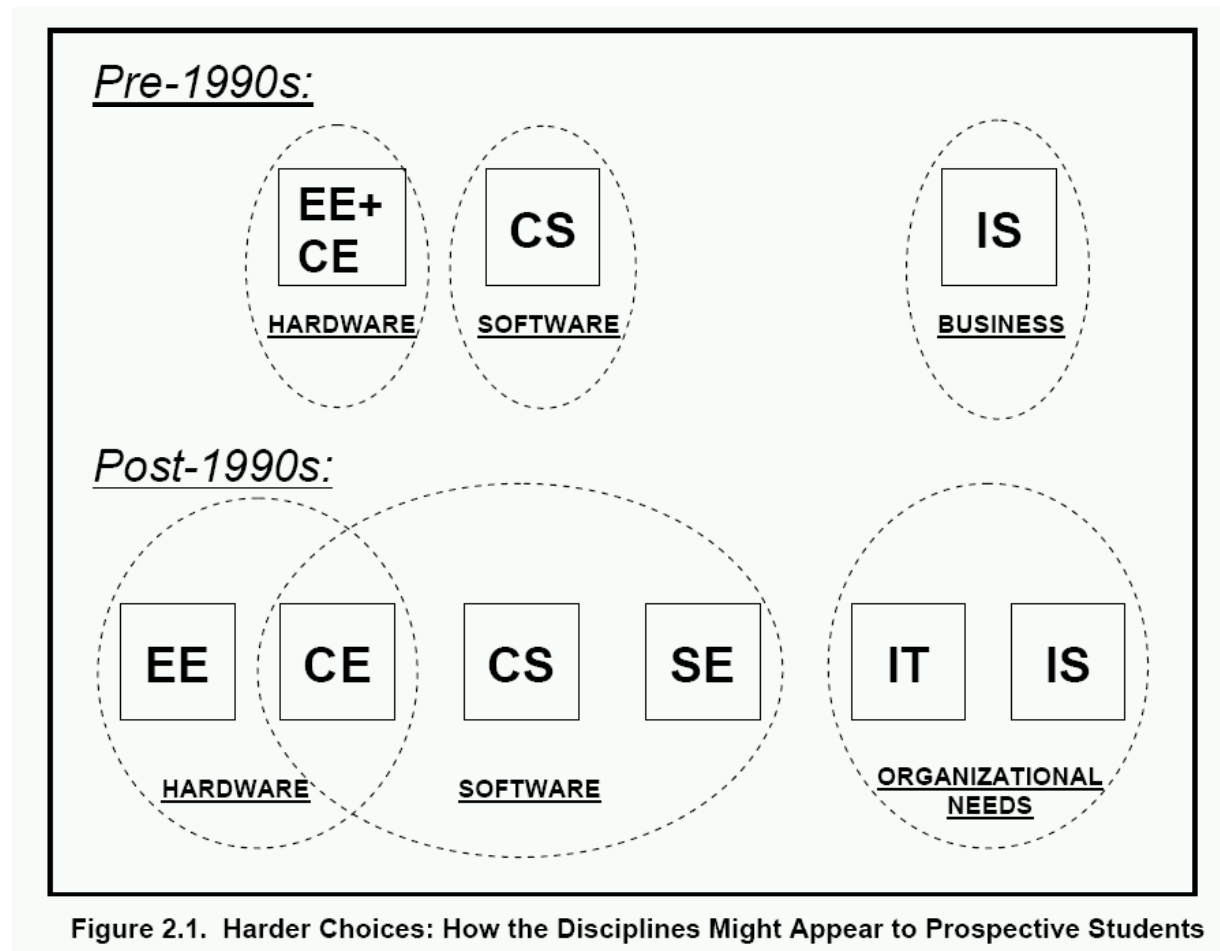


Figure 2.1. Harder Choices: How the Disciplines Might Appear to Prospective Students

Graphical Representations of IS and IT in CC2005

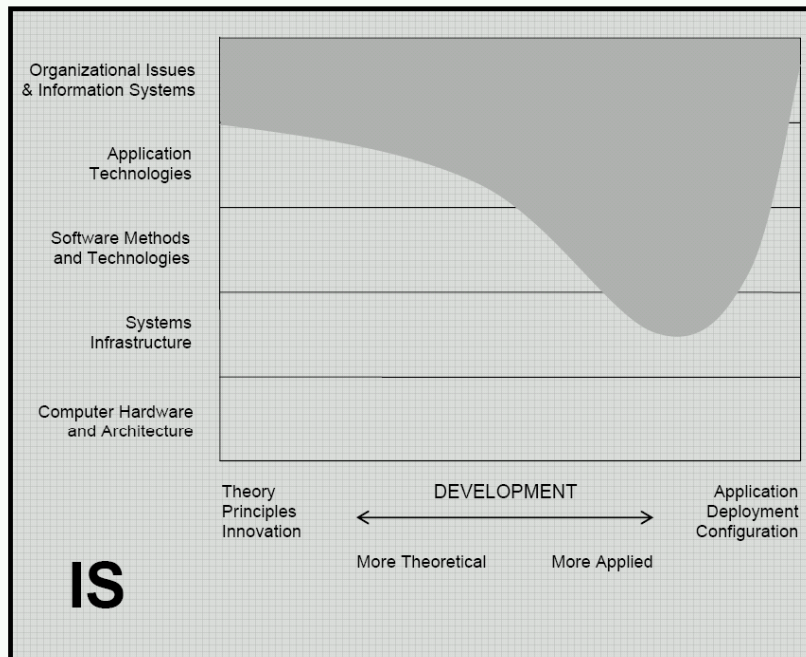


Figure 2.5. Information Systems

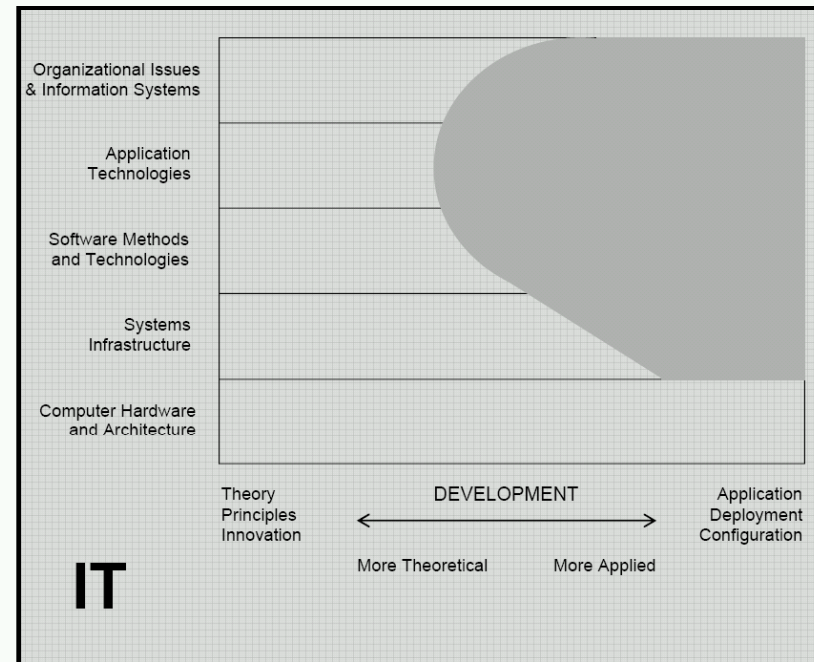
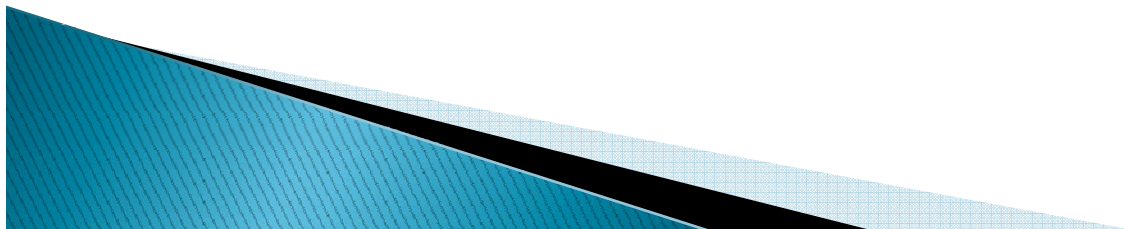
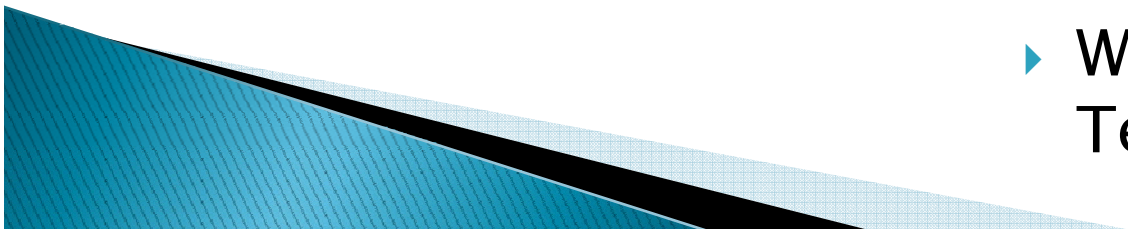


Figure 2.6. Information Technology



IT Knowledge Areas

- ▶ IT Fundamentals
- ▶ Human–Computer Interaction
- ▶ Information Assurance and Security
- ▶ Information Management
- ▶ Integrative Programming and Technologies
- ▶ Math and Statistics for IT
- ▶ Networking
- ▶ Programming Fundamentals
- ▶ Platform Technologies
- ▶ Systems Administration and Maintenance
- ▶ Systems Integration and Architecture
- ▶ Social and Professional Issues
- ▶ Web Systems and Technologies



Differences Between the IS and IT Curricula

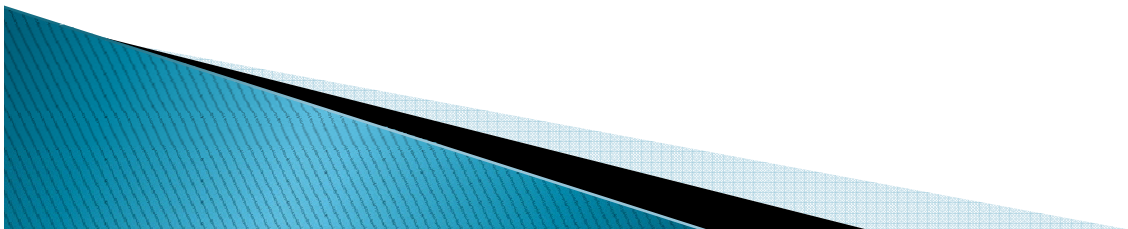
- ▶ Domain knowledge and domain-IT integration in the core of IS
- ▶ Modeling (process, data, system) as a core capability → SA&D
- ▶ Focus on IS/IT strategy and management
- ▶ Strong emphasis on business value of IT
- ▶ Role of domain(s) acknowledged but not core
- ▶ Technology itself in the core of the discipline
- ▶ Stronger focus on development, IT infrastructure, and other technical IT skills than in IS

Information Systems

Information Technology

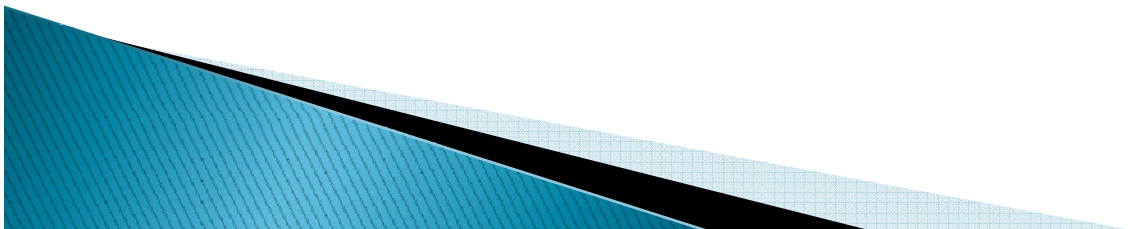
Similarities and Joint Interests

- ▶ Focus on the use and the applications of IT
- ▶ Interest in the benefit that user(s) can reap from the technology
- ▶ Interest in the practice of IT in organizations
- ▶ Job roles highly dependent on each other
- ▶ Specific areas where technical capability sets overlap (data/information management, infrastructure management, project management)



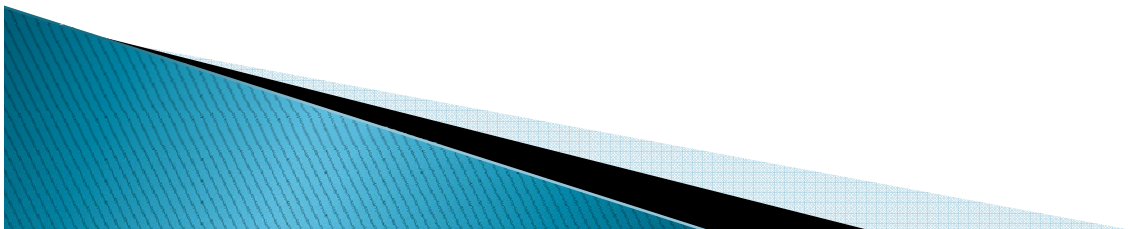
Discussion Questions

- ▶ Do the emergence of the IT discipline and the approval of the IT curriculum change the requirements for the IS curriculum?
- ▶ Would we be willing to borrow from the IT curriculum?
- ▶ Should we attempt to be at the table during the future efforts to develop the IT curriculum further?



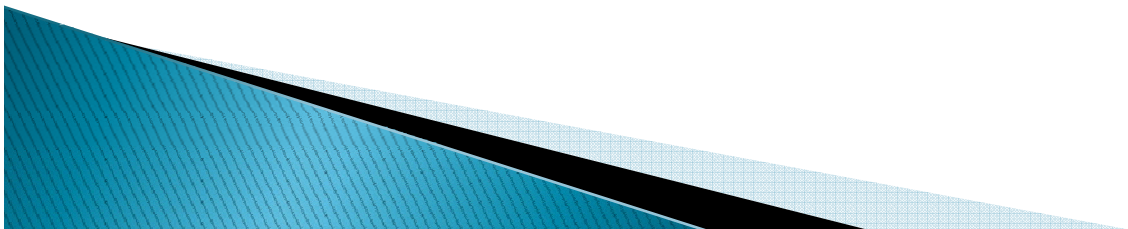
Process Schedule

- ▶ 12/1/2008 – 1/15/2009:
 - Receive feedback on *Curriculum Topics and Courses*
 - Present at AIS SIG-ED: IAIM
 - Continue to work on the draft curriculum document
 - Update body of knowledge
- ▶ 1/15/2009: Release the draft curriculum document for public review
- ▶ 1/15/2008 – 2/28/2009: Receive feedback on the draft curriculum document; Continue to update the body of knowledge
- ▶ 3/1/2009 – 4/30/2009: Revise the curriculum document and submit to ACM & AIS for approval

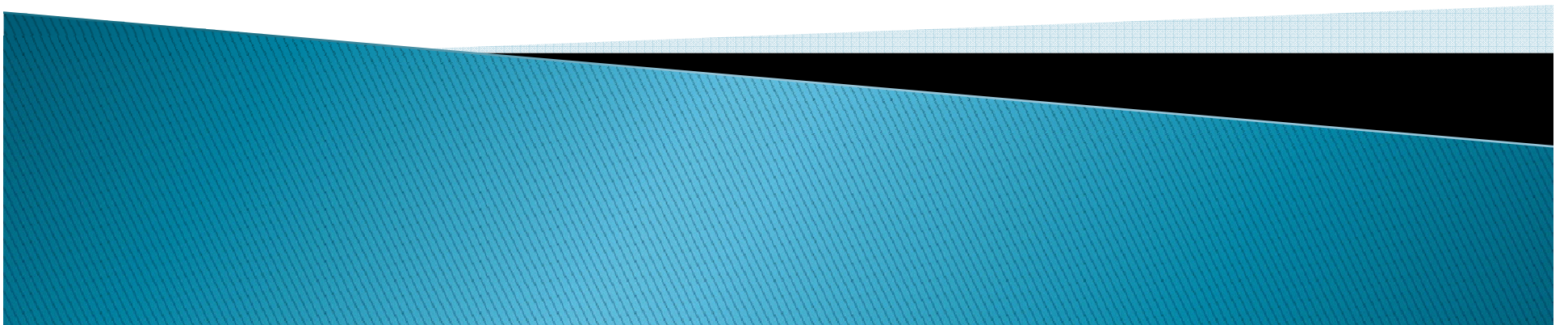


How Can You Contribute?

- All members of the IS community are encouraged to participate actively in the discussion on the wiki (<http://blogsandwikis.bentley.edu/iscurriculum>)
- You are able to review and comment on any aspect of the revised curriculum recommendation
- You can also contact the curriculum task force co-chairs Heikki Topi (htopi@bentley.edu) and Joe Valacich (jsv@wsu.edu) directly and give your feedback to them
- Tell about the project to as many colleagues of yours as possible and invite them to participate



Thank you!!



Information Systems Specific Knowledge and Skills

- ▶ Identifying and designing opportunities for IT-enabled organizational improvement
 - Ensuring alignment between IT strategy and organizational strategy
 - Improving organizational processes
 - Identifying and exploiting opportunities created by emerging technology innovations
 - Understanding and documenting information requirements
 - Improving various stakeholders' experience in interacting with the organization (user experience)
- ▶ Analyzing trade-offs
 - Designing and comparing high-level solution and sourcing options
 - Capital budgeting for IT-intensive projects; making a financial argument for choosing b/w alternatives

Information Systems Specific Knowledge and Skills

- ▶ Designing and implementing information systems solutions
 - Designing enterprise architectures
 - Identifying, evaluating, and procuring solution and sourcing options
 - Ensuring high-quality user experience
 - Securing data and systems
 - Designing, implementing, and configuring applications and integrated systems
 - Managing and exploiting organizational data and information
 - Managing information systems development/procurement resources
 - Managing information systems projects
- ▶ Managing ongoing information technology operations
 - Managing the use of enterprise technology resources
 - Maintaining existing information systems
 - Managing relationships with technology service providers
 - Securing data and systems infrastructure
 - Ensuring business continuance