



CONFERENCE ON SERVICE SCIENCE, MANAGEMENT & ENGINEERING (SSME):

*Towards Philippine Global Competitiveness
In Offshoring & Outsourcing*

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C.P. Garcia Ave., Diliman, Quezon City



Information Technology Services Curriculum (ITSC):

an IT specialization within Service Science, Management & Engineering (SSME)

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IT Services Curriculum (ITSC)—SSME's IT Track

Addresses the World Shortage in Global Knowledge Professionals

Globally - the Need for Knowledge Professionals is Greater than Ever

In the U.S. alone, 1.5 million additional Global Knowledge Professionals needed now.

Key target is 2011: US & UK demand alone will outstrip supply

70M Baby Boomers exit workforce during next 15 years; only 40 million workers enter.

Between 2010 and 2020, the US, Europe, Japan, China, and India will face a shortfall of 32 Million technically specialized professionals



IT Services Curriculum

- Talent pool for Philippine Cyber Corridor
- Contributes to the Philippine goal of 1M ICT jobs by 2010...
- ...and sustained Philippine leadership in Offshoring & Outsourcing

ITSC Value

Universities

Aid curricula evolution to reflect the role of services in the IT industry

Attract students to CIS and CS programs by matching courses to Industry's demands

Universities are shifting to a services orientation – ITSC is a fundamental aspect of services

Students

The IT Services curriculum will prepare students for today's and future information technology and technically oriented business management job opportunities

Students would be in a position to bring significant and innovative change to IT services

Graduates with ITSC knowledge could obtain several product and industry certifications

Paired with systems management tools, ITSC provides practical hands on experience for greater job prospects

Industry

Accelerated readiness of the workforce will help alleviate skills availability issues

Bridge the communication gap between IT functional jobs and business leader vision

Significantly reduce transitional or "ramp up" costs for college graduates entering the workforce

ITSC Components – Services Topics

- IT Systems Architecture
 - Management system architecture
 - Service and component design
 - Service Oriented Architecture
 - Technology governance
 - Architectural methods
- Infrastructure Services
 - IT Services Operations
 - IT management system evaluation
 - Performance Management
 - Server administration
 - Backup and restore
 - Storage
 - Event
 - Availability
 - Capacity
 - Facility
 - Network
 - IT Recovery
 - Security
- Business
 - IT Strategy
 - Service marketing and sales
 - Service requirements management
 - Service creation
 - Service request management
 - Service Level Attainment
 - Client relationships
 - Portfolio management
 - Customer satisfaction management
 - Service pricing and contract administration
 - IT workforce management
 - Service continuity
 - Project management and service deployment
 - Solution globalization and accessibility
 - Data privacy
- Configuration
 - Change
 - Asset
 - Software distribution and license management
 - Electronic inventory

Keyword	Number of Openings
Incident management	1,582
Database administrator	2,443
IT architect	4,874
Solution architect	5,753
Programmer	7,654
Computer operations	20,607
Problem management	42,468
IT service management	46,697
Systems management	79,048

18,940

All services topics = 73,300

ITSC Components – Services Topics

- Service Improvement
 - Incident
 - Problem
 - User contact
 - Product release
 - Risk management
 - Process improvement
 - IT solution test
 - IT service acceptance
 - IT Knowledge Management
 - Capacity Management
- On demand IT services
 - IT resource metering
 - Consumption based billing
 - Autonomic IT infrastructure
- Advanced
 - Service Oriented Architecture
 - Services integration
 - Security
 - Disaster or business recovery and resiliency
 - Data management
 - IT service research
 - IT service reporting
 - IT infrastructure consolidation
 - IT infrastructure virtualization
 - Business process management
 - Policy based autonomic computing

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39.157

IT Services Economics at IBM

■ Global IT Services Marketplace*

- 6% compounded annual growth rate from 2006 to 2008
- 2008 market should be roughly \$762 Billion
- North America predicted to be \$337 Billion, Europe \$221 Billion, Asia \$44 Billion
- Eastern Europe was \$4.8 Billion in 2004 and should be \$6.5 Billion by 2008

* <http://www.informationweek.com/showArticle.jhtml?articleID=26800067>

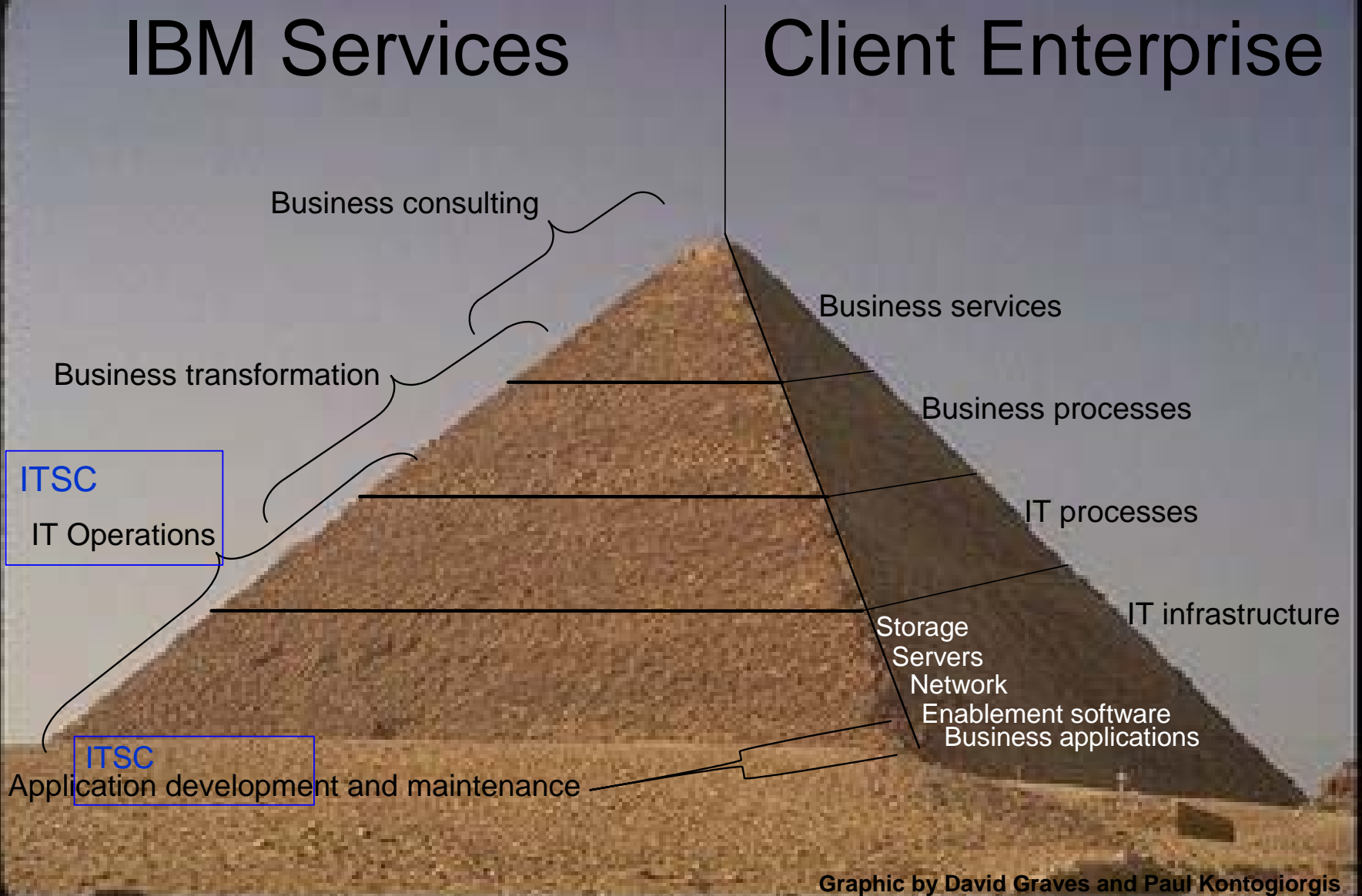
■ IBM IT Services Organization

- Over 220,000 personnel in 170 countries of 386,000 total
- 2007 Services revenue was over 54 billion of 98.8 billion total
- Managing for clients
 - 342 data centers comprising over 6 million square feet of raised floor
 - 1,100 mainframe servers with 10,000 terabytes of storage
 - 166,000 distributed servers with associated Storage Area Networks
 - 13 million LAN ports, 56,000 routers and switches, 2,400 firewalls
 - 3.5 million end user computers generating 21 million help desk calls per year

ITSC Positioning

IBM Services

Client Enterprise



Graphic by David Graves and Paul Kontogiorgis

Information Technology (IT) Service Definition

- **An IT service is the advertised and delivered function provided by the execution of repeatable IT operational processes to support business needs**

- **IT services can generally be classified as stakeholder or IT element focused**
 - The “user request management” IT service is stakeholder focused e.g. call centers
 - The “software distribution” IT service is IT element focused e.g. data centers
 - Many cases exist that an IT service may be considered equally in both classes, for example “license management”
 - Although IT services can be delivered modularly they are often inextricably linked together

IT Service Examples

- **IT Element focused service examples**

- Data transfer and translation
- IT asset change control
- Device and application availability management
- Computing infrastructure architecture
- Operations management
- Software distribution

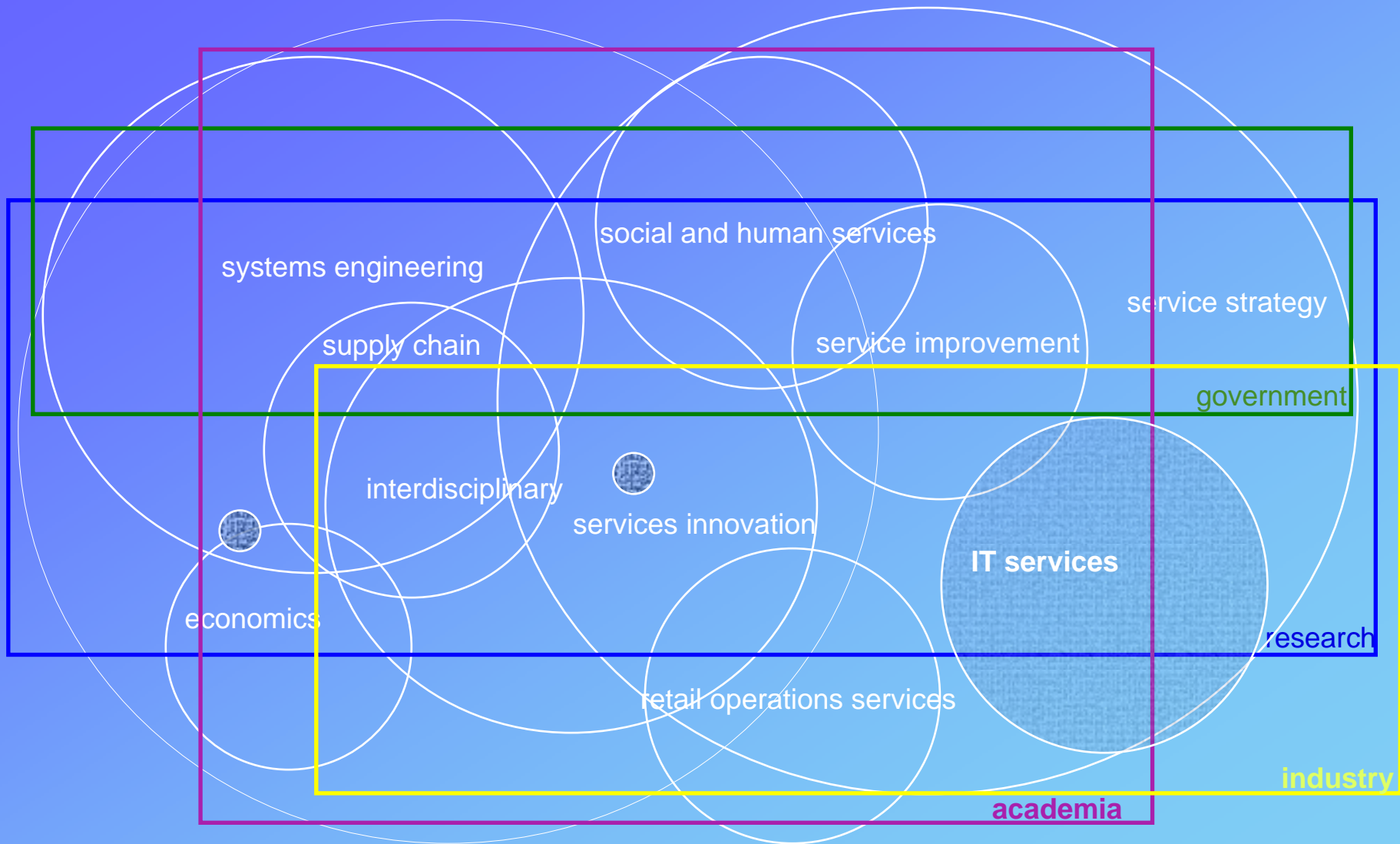
- **Stakeholder focused service examples**

- Help desk and end user support
- IT Security policy administration
- Application development and maintenance
- User authentication and authorization
- Service request management
- Service level attainment
- Service creation

- **IT Taxonomy Inputs**

- IBM's PRM-IT
- ITIL
- Cobit
- ISO20000

IT Services Curriculum Positioning



Graphic by David Graves and Paul Kontogiorgis

ITSC Components

All courses and degrees may be business or technically oriented

Bachelor Degree Tracks

IT Infrastructure Management – Managing IT Elements

IT Service Management – Managing Relationships and Service Quality

Master and Doctoral Tracks

IT Services Integration

Business Process Management

Policy Based Autonomic Infrastructures

Security

Storage

The post graduate degree tracks represent the frontier of IT Services and offer significant opportunity for contribution and innovation by participating universities and candidates

ITSC Collaborations

- Over 90 universities have offered and are currently offering courses based on ITSC in over 15 countries.
- 3 universities in the US are already offering ITSC programs (including Missouri State – Business Undergraduate).
- At least 27 more universities in 5 countries (US, Thailand, Czech Republic, Mexico, Taiwan) are planning ITSC programs to start in Fall 2008.
- More than 200 additional schools have shown interest in ITSC in over 20 countries by requesting course materials through the IBM web site
- More than 150 additional schools in 28 countries have shown interest in ITSC (courses and/or programs) by requesting follow-up meetings after introductory meeting to the program.
- More than 100 additional schools in over 20 countries met through various conferences have shown interest in ITSC by requesting meetings for introduction to the program.

Sample Curriculum Topics – IT Security Services

Bachelor or Master of Science in IT Security Services

- Internet security
- Ethical hacking
- Secure systems
- Smart cards
- Sensors & vulnerability analysis
- Secure payment systems
- Antivirus
- Privacy technology
- Biometrics
- Multiparty protocols
- Firewall Management
- Physical and Logical Aspects
- Virus Services
- Trust policies
- Cryptographic hardware and software
- Digital watermarking
- XML security
- Intrusion detection and prevention
- Incident management
- Vulnerability scanning and assessment
- Compliance management
- Intelligence
- Email security management
- Forensic analysis
- Security Monitoring
- ID Management
- Risk Management

Sample Curriculum Topics – Service Oriented Architecture

Master of Science in Service Oriented Architecture

- Web Services Description Language
- SOA Lifecycle
- SOA Reference Architecture
- SOA Programming Model
- SOA Standards
- BPEL
- ESB
- SOA Adoption & Transformation
- SOA Assessments
- CBM
- SOA Governance
- SOA Tools
- Web Services and XML
- Service Component Architecture
- SOA Security

Curriculum Course Plan – Service Oriented Architecture

Master of Science in Service Oriented Architecture

- SOA Overview (Topics include: CBM, SOA Standards (BPEL, ESB, WSDL), SOA Tools, SOA Lifecycle, SOA Reference Architecture, Web Services and XML)
- Developing an SOA Solution I
- Service Oriented Modeling
- SOA Programming Model to (Topics include: SOA Tools, Service Component Architecture SOA Standards, Web Services and XML)
- Design an SOA Solution 2 - (Topics include: BPEL, ESB, WSDL, SOA Ref. Architecture)
- SOA Governance
- SOA Security
- SOA Assessments, Adoption & Transformation and Maturity (Topics include SIMM (Service integration Maturity model - adoption, maturity, and assessments) and OSIMM)

Sample Curriculum Topics – Autonomic Computing

Master of Science in Autonomic Computing

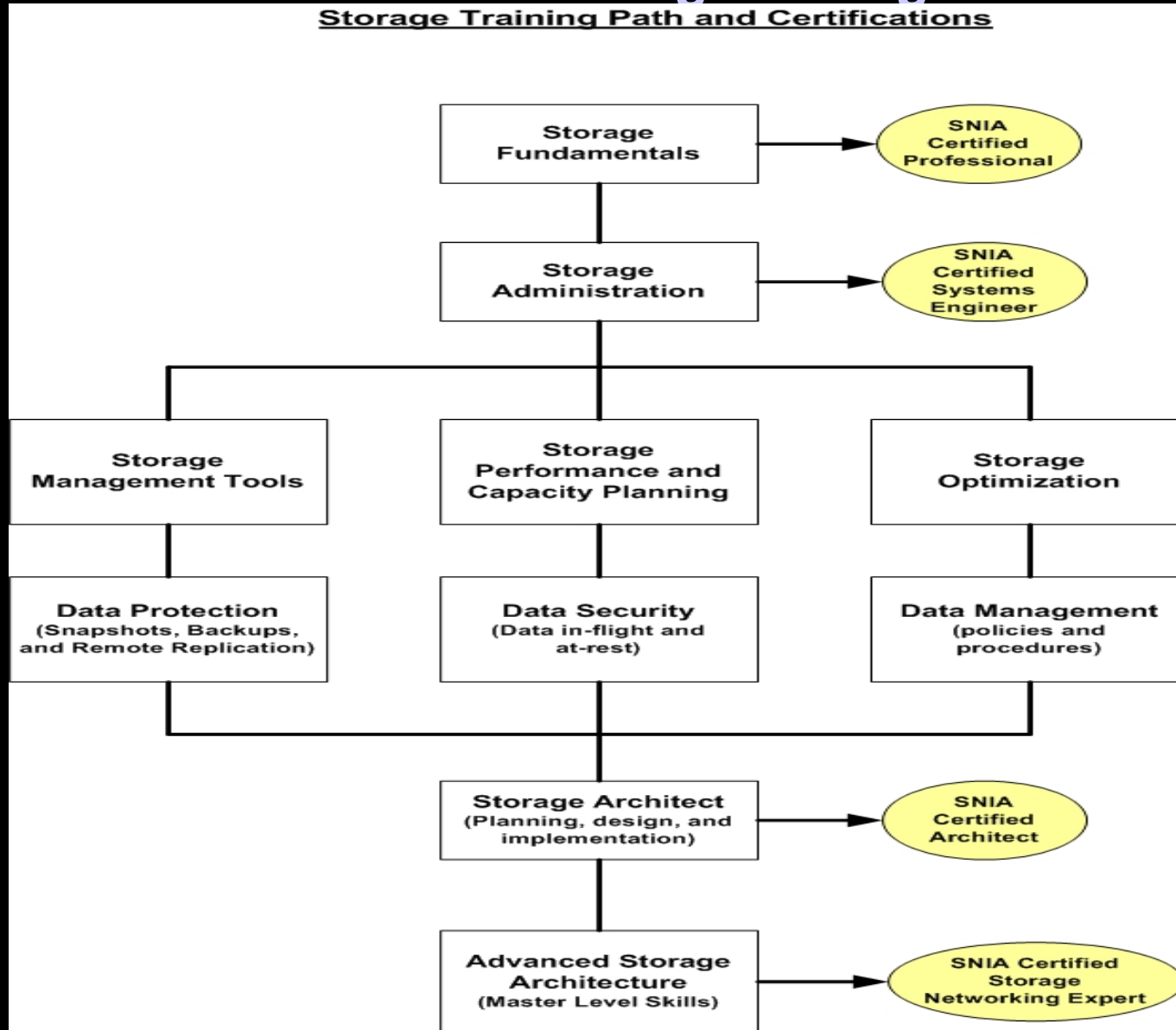
- Infrastructure Provisioning
- Business Process Management
- Resource Management
- Workflow Management and Orchestration
- Autonomic Computing Engineering
- Autonomic Software Mechanisms
- Business Rules Modeling and Processing
- Autonomic Computing and Process Control
- Analytics and Behavior Forecasting

IT Services for Software Development

Master of Science in Software Development Services

- Software Deployment Management (Descriptors, other topics...)
- Software Test Management I (Planning, Functional testing, Unit testing)
- Software Test Management II (Load testing, Performance testing)
- Security in Application Development
- Software Development Architecture (Processes)
- Enterprise Integration
- Software Development Configuration Management (Artifact management, documentation, policy management, etc.)
- Software Development Platform (Logical Partitions (VMWare, Ipars), supporting computing systems, programming languages (Java), applications, storage, and network)

Curriculum Course Plan – Storage Management



Implementation - Actual Curriculum in IT Service Management

College of Business, Department of Computer Information Systems

Bachelor of Science in IT Service Management

■ Sophomore

- Computer Technology I
- Computer Technology II

■ Junior

- Foundation in IT Service Management
- IT Security Management
- Internship in IT Services – summer program

■ Senior

- IT Services Project Management
- Incident and Problem Management
- IT Service Level Management

Implementation – Recommended Core Courses

- Foundations in IT Services I and II
- Business Systems Management I and II
- IT Architecture/Consultancy
- IT Project Management
- SOA Overview
- IT and the Service Economy
- IT Service Programming
- Emerging Technologies and IT Services

Implementation - Variations

- Incorporation into existing course
- Introduction of new course as an elective
- Introduction of new course as a choice from a list of a required list
- Introduction IT Service Certificate Program
- IT Service Set to meet minor in or concentration in requirements
- Full IT Service degree program

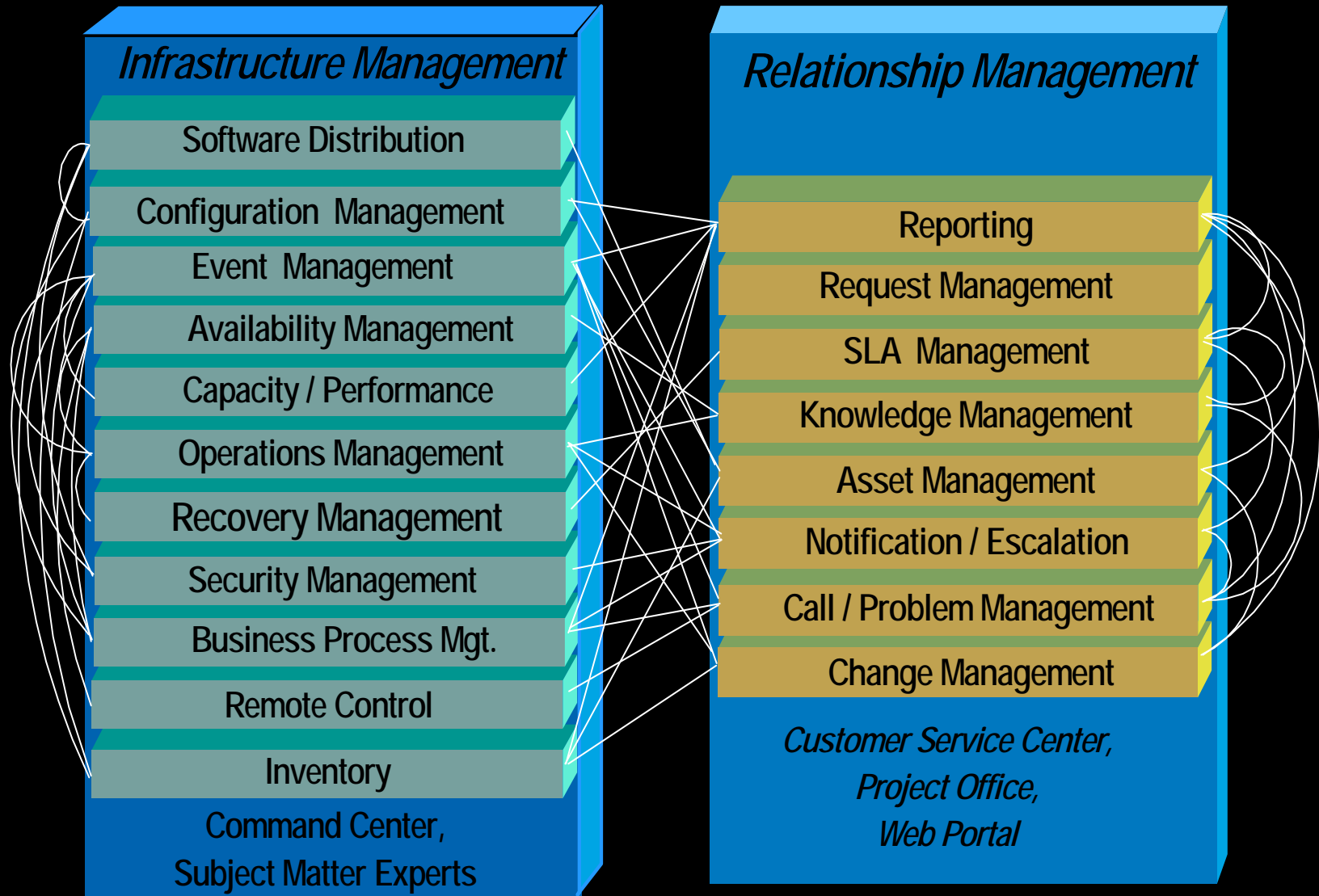
Implementation – Required Pedagogical Material

- Course content
- TTT Material (Lecture notes)
- Supporting material including hw, exams, case studies, labs, additional references, etc.

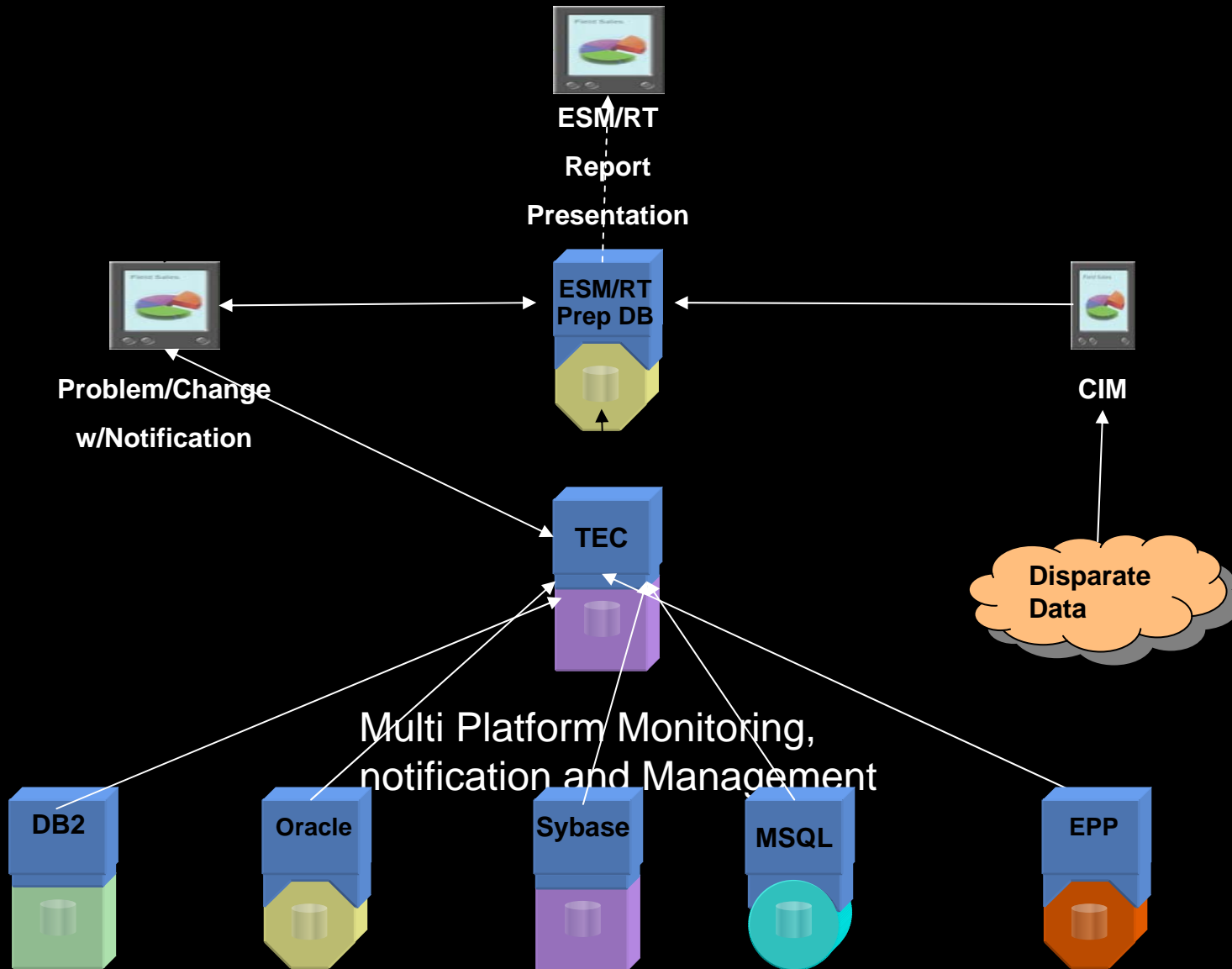
Formulating interesting research problems

- IT Services Integration
- Evolving IT Services (Green Data Center, Cloud Computing, SaaS, Grid, etc)
- Labor workforce trends and GIE
- SSME (Service Science Management and Engineering)

ITS Research Integration - DASLA



ITS Research Integration - DASLA



For More Information

- ITSC home page

<https://www14.software.ibm.com/webapp/devtool/scholar/web/coursewarePickPage.do?source=ai-course-it-services>

- IBM Academic Initiative

www.ibm.com/university

- IBM University Relations

<http://www-304.ibm.com/jct09002c/university/scholars/ur/index.html>

- ITSC contacts

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