
# *Top 3 Technology Trends/ Issues Affecting Higher Education*


How to address these trends as an IT Executive

by

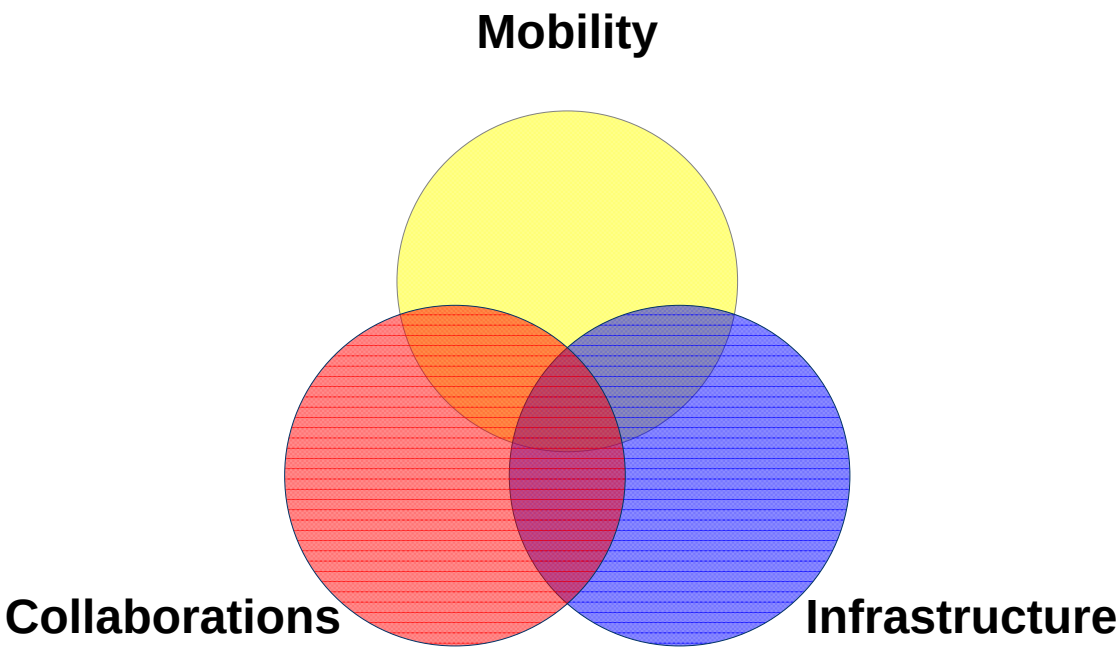
James M. Dutcher

# Agenda

- Part I – Research Sources for Tech Issues/Trends
- Part II – Top Three Tech Issues/Trends
- Part III – Managing the change of the Tech Issues/Trends
- Part IV – Q&A

# TOP 3 Tech Issues/Trends for Higher Education

1. Infrastructure
2. Collaborations
3. Mobility



# Part I

## ***Research Sources for Tech Issues/Trends***

# Research Sources for Tech Issues/Trends

- The Horizon Report – 2008 Edition (via EDUCAUSE) [1]
- The Gartner Group [2]
  - Top Ten Disruptive Technologies for 2008 to 2012;
  - 2008 Top Ten Strategic Technologies for next 3 years
- EDUCAUSE CIC – Current Issues Committee (member since 2006)
  - EDUCAUSE Review (Volume 43, Number 3, May/June 2008 ) - Top-Ten IT Issues, 2008 [3]
  - EDUCAUSE Quarterly Volume 31, Number 2, 2008 - Current Issues Survey Report, 2008 [4]
- Other Publications:
  - Book - Higher Education in the Digital Age: Technology Issues and Strategies for American Colleges and Universities [5]
  - Book - Wikinomics - How Mass Collaboration Changes Everything [6]
  - The Future of the Web, Intelligent Devices and Higher Education; EDUCAUSE; EDUCAUSE Review [7]
  - James M. Dutcher – Binghamton Press – Op Ed pieces.[8]
    - Infrastructure Eco-Systems
    - Fixing SUNY
  - Collaboratories – The Future of Academic/Scientific Research [9] [10]

# *The Horizon Report – 2008 Edition*

- **Time-to-Adoption: One Year or Less**
  - Grassroots Video
  - Collaboration Webs
- **Time-to-Adoption: Two to Three Years**
  - Mobile Broadband
  - Data Mash-ups
- **Time-to-Adoption: Four to Five Years**
  - Collective Intelligence
  - Social Operating Systems

# The Gartner Group - Top Ten Disruptive Technologies for 2008 to 2012

- Multi-core and hybrid processors
- Virtualization and fabric computing
- Social networks and social software
- Cloud computing and cloud/Web platforms
- Web mash-ups
- User Interface
- Ubiquitous computing
- Contextual computing
- Augmented reality
- Semantics

- Gartner –2008 Top Ten Strategic Technologies for next 3 years
  - Green IT
  - Unified communications
  - Business process modeling
  - Metadata management
  - Virtualization 2.0
  - Mash-up and composite applications
  - Web platform and "cloud computing"
  - Computing fabric
  - Real world web
  - Social software

# EDUCAUSE CIC – Current Issues Committee**

- Top-Ten IT Issues, 2008
  1. Security
  2. Administrative/ERP/Information Systems
  3. Funding IT
  4. Infrastructure
  5. Identity/Access Management
  6. Disaster Recovery / Business Continuity
  7. Governance, Organization, and Leadership
  8. Change Management
  9. E-Learning / Distributed Teaching and Learning
  10. Staffing / HR Management / Training

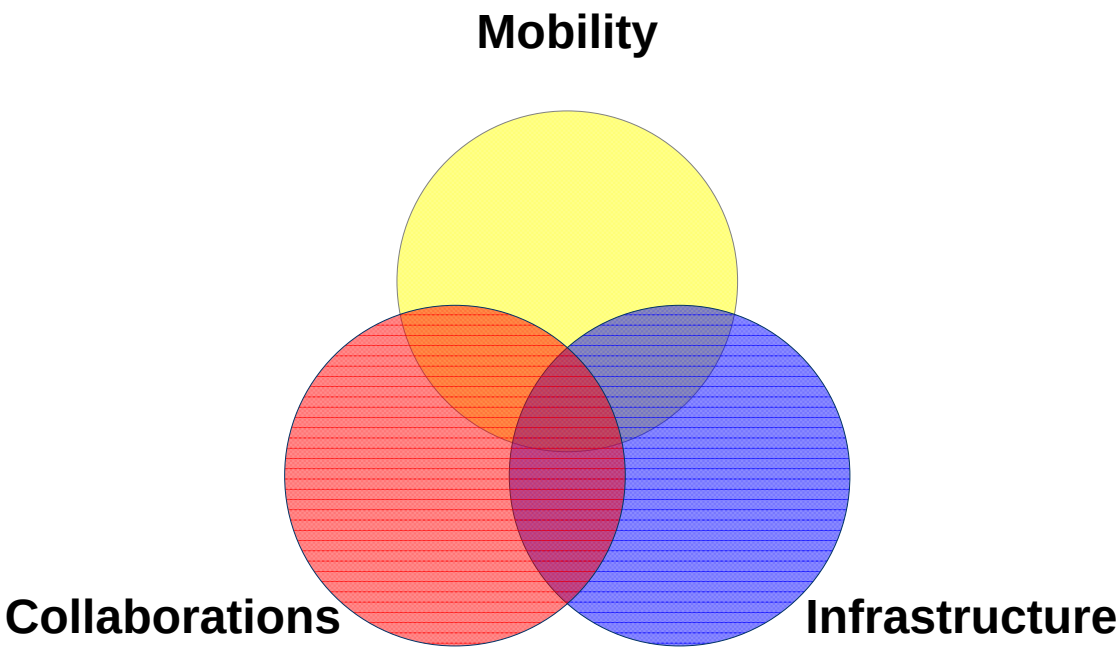
(** member since 2006)

# Part II

## ***Top Three Tech Issues/Trends***

# TOP 3 Tech Issues/Trends for Higher Education

1. Infrastructure
2. Collaborations
3. Mobility



# TOP 3 Tech Issues/Trends for Higher Education

## 1. Infrastructure

- Network
  - Increasing bandwidth – Wired, Wireless, WiFi, Cellular
  - Beyond Internet2 – CERN, terabyte networking and beyond
- Data Center
  - Server Blades
  - SANs
  - Virtualization
- RESULTS:
  - Quick implementation of applications and web-based services
  - Safe/Secure IT Environments; Efficient IT management of hardware and services
  - Cost savings – HW/SW procurements, maintenance and utilities (Green IT)
  - Highly available data/info accessible data/info from anywhere anytime
  - **Cloud/Grid Computing: "The Internet is the operating system"**
    - Web 2.0; SaaS (software as a service); Mash-ups
    - Multimedia (audio/video)
    - Simulated environments
    - Enabler of On-Line **Collaborations**

# TOP 3 Tech Issues/Trends for Higher Education

## 2. Collaborations

- On-line collaborations
  - Front end – Students (aka Customers)
    - Enhanced educational experience & Participatory research
  - Back end – Employees of the organization – planning, decision making and day-to-day operations.
- Eco-Systems [8]
  - New knowledge areas/academics [11] [12]
- Collaboratories [9] [10]
- RESULTS:
  - Partnerships for success – in 3D (dimensions) – with students, internally among departments, externally with vendors, non-profits, government, other colleges, and internationally
  - **Mobility:**
    - Collaborations anytime/anywhere with true 24X7X360° (anytime/anywhere) support and services
    - Real time planning decision support
    - True mobile experience (laptops, smart phones)
    - Enhanced research – real-time data gathering/analysis for both academic & business purposes

# TOP 3 Tech Issues/Trends for Higher Education

## 3. Mobility

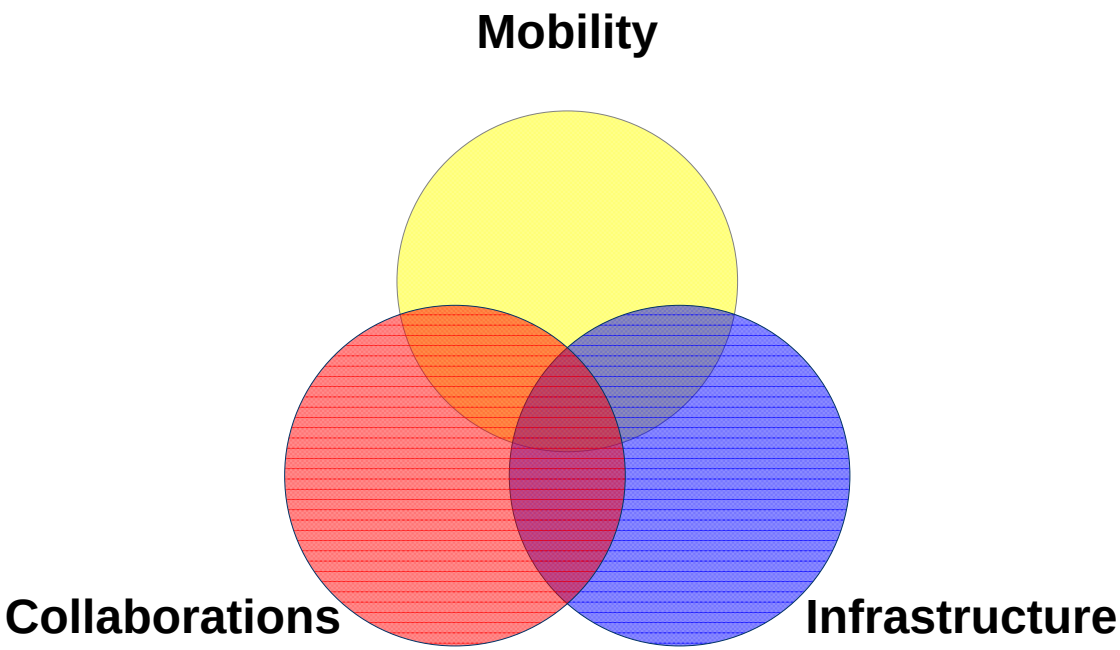
- Use of iPods, iPhones, Blackberries and (more generically) smart phones
- For students
  - Download educational/course snippets to learn on the go or refresh just before an exam
  - Data collection/analysis for research and academic assignments
  - Real time/ad-hoc experiential and simulations for academics
- For employees
  - Enhanced/improved communications
  - Project collaboration
  - Document sharing
  - Real-time/ad-hoc planning
  - Real-time/ad-hoc support services
  - On demand, day-to-day management & decision making
  - Fast and efficient organizational processes from anywhere at anytime
  - Cost savings to the organizations

# Part III

## ***Managing the Change of the Tech Issues/Trends***

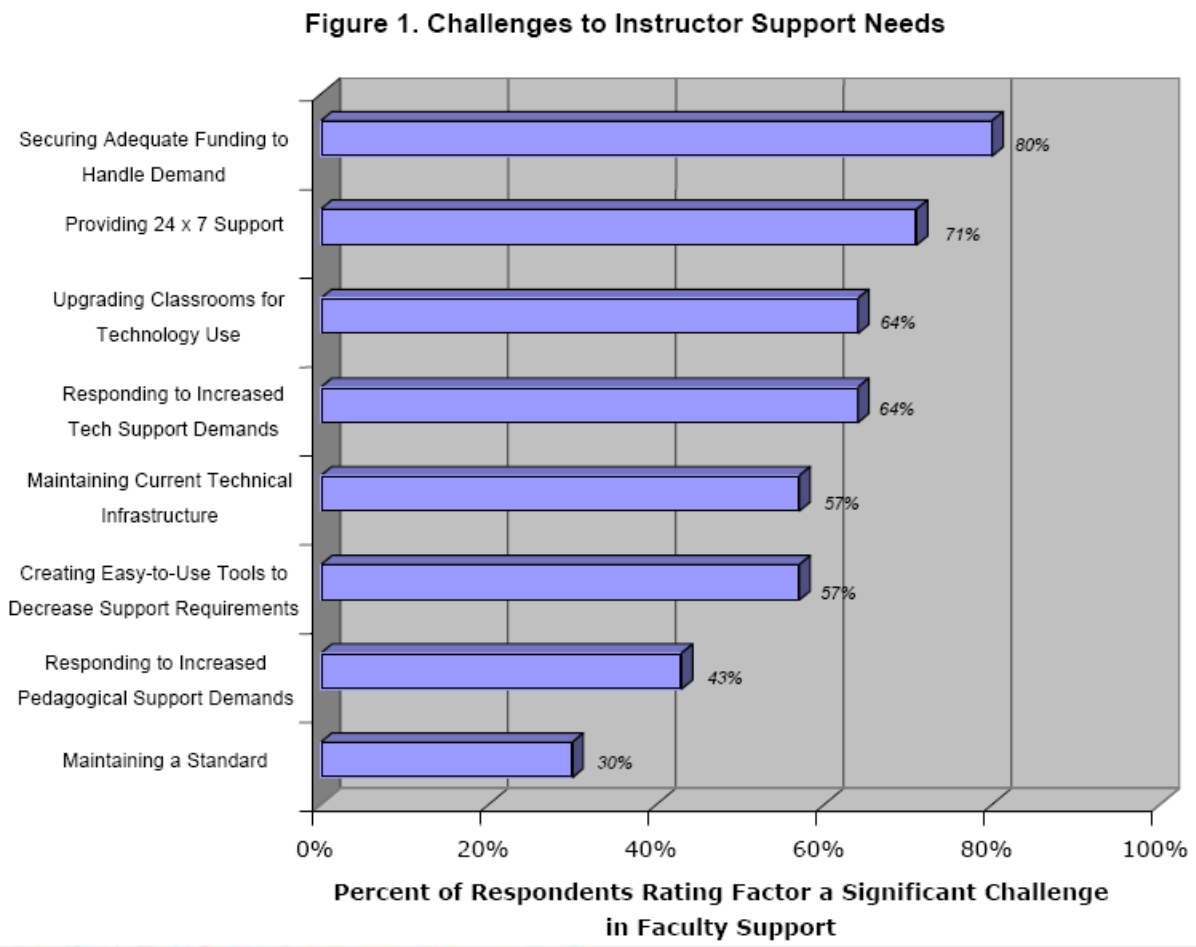
# TOP 3 Tech Issues/Trends for Higher Education

1. Infrastructure
2. Collaborations
3. Mobility



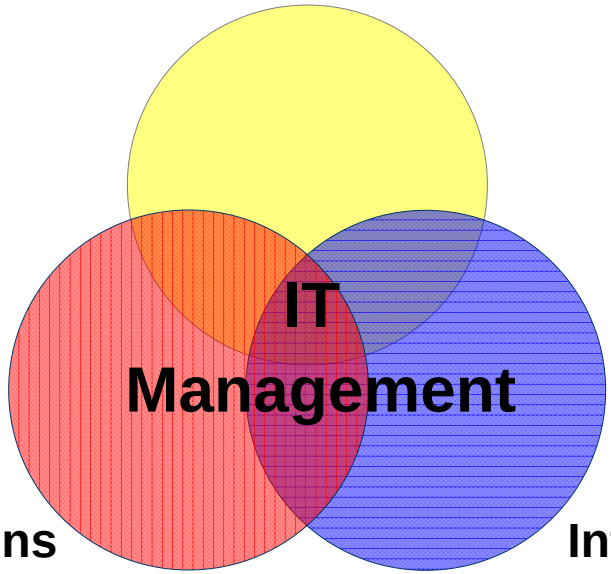
# Managing Customer Service

- IT Management  Customer Service Issues and Challenges
  - Issues and challenges for Higher Education IT Managers - managing customer service [13] [14] →[15]****



# Managing Customer Service

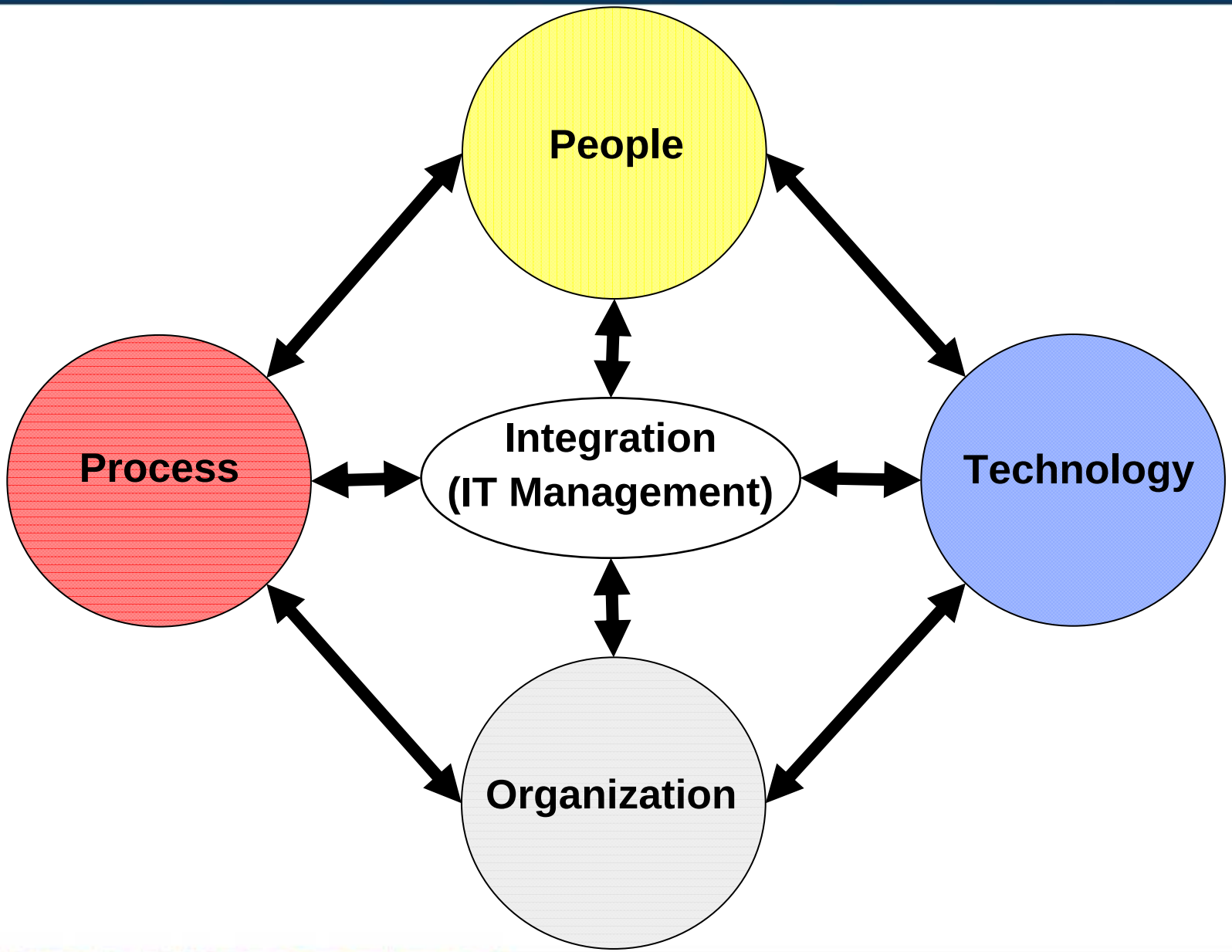
People - Mobility




Processes-Collaborations

Infrastructure - Technology

# Managing Customer Service (ITSM)



# Managing Customer Service

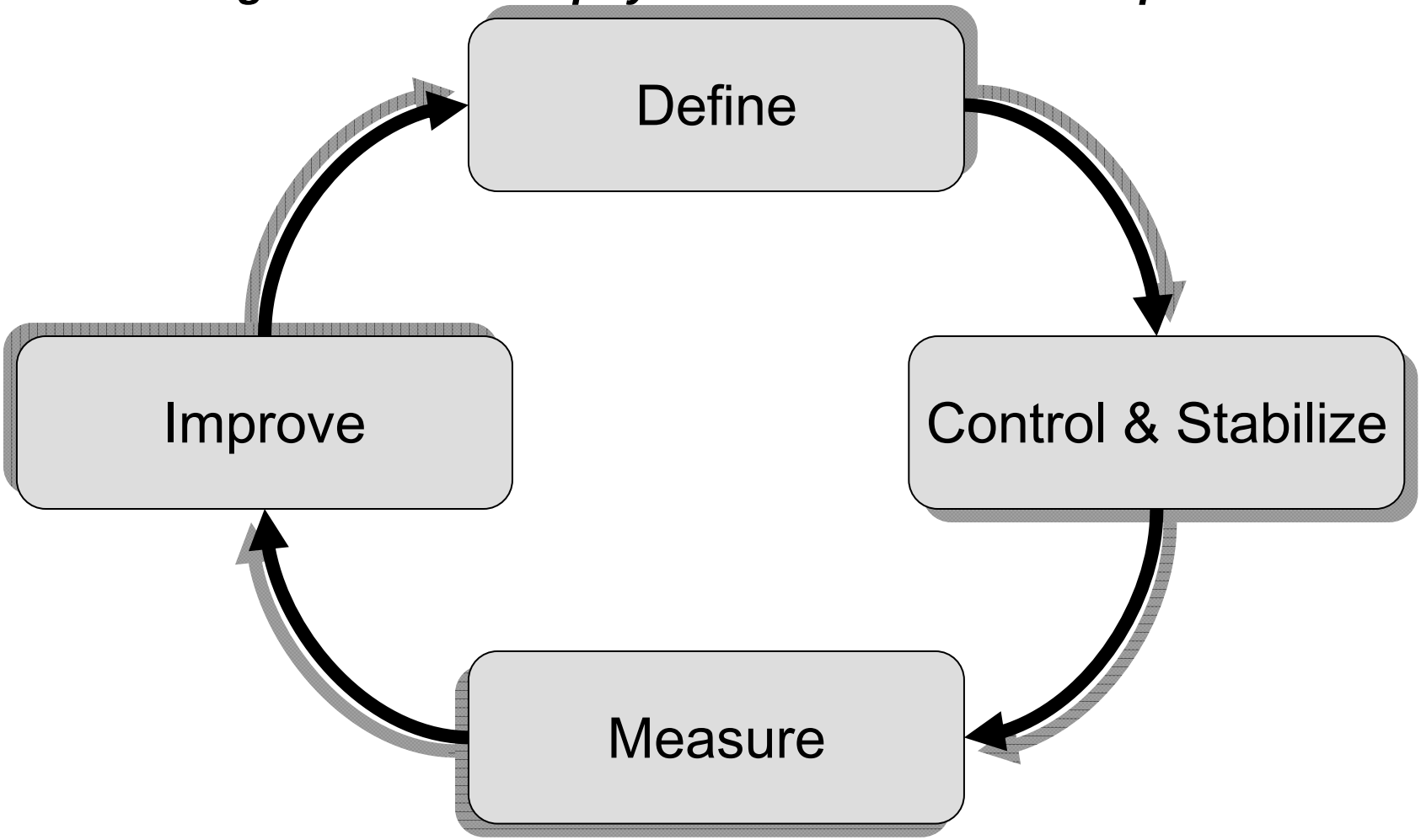
- IT Management – Technology Infrastructure
  - Maintaining Technological Currency
    - PCs
    - Network
    - Software/Applications
    - Other
  - Planning/Budgeting for maintenance & replacement
    - Keeping HW under proper warranty
    - Maintaining software/application licensing
    - Replacement policies for hardware (computer, network, server, etc)
    - Establishing Leasing/turn-over cycle
      - Allows for optimal planning/support
      - Spread costs out – removes big “one-time” hits to the budget.
  - Critical Success Factor is proper (operational) planning/budgeting

# Managing Customer Service

- IT Management – Processes [15]
  - ITIL – Information Technology Infrastructure Library
  - ITSM – Information Technology Service Management
    - People, Process, Technology, Organization, Integration
    - Critical Success Factors are to
      - Stabilize
      - Standardize
      - Establish repeatable IT processes (planning, managing, budgeting)
      - IT Management philosophy of continuous improvement (with assessment and feedback)
        - » Define, control & stabilize, measure, improve

# ITSM - IT Management Philosophy

***IT Management Philosophy: Continual Process Improvement***

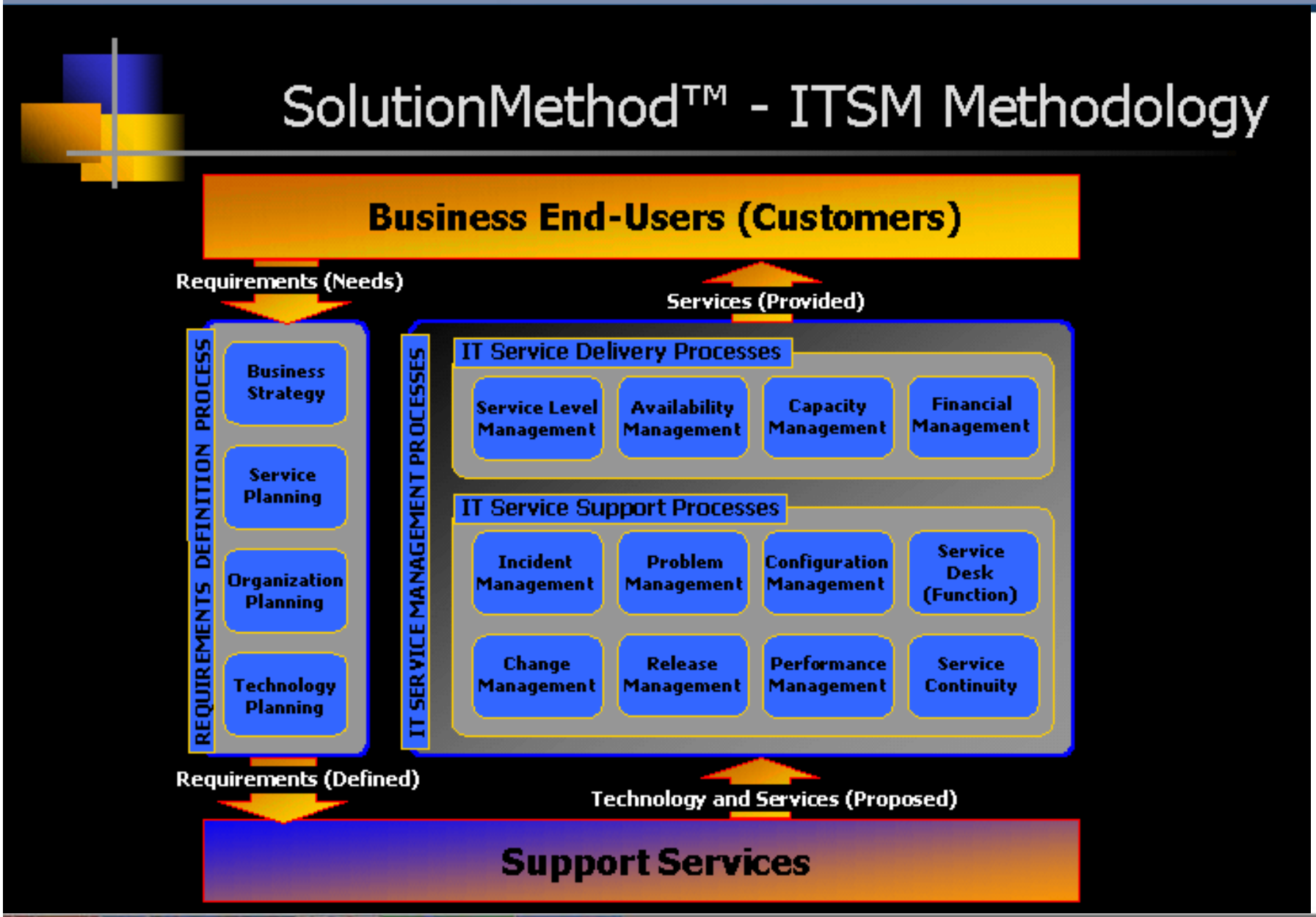



**What is not defined cannot be controlled**
**What is not controlled cannot be measured**
**What is not measured cannot be improved**

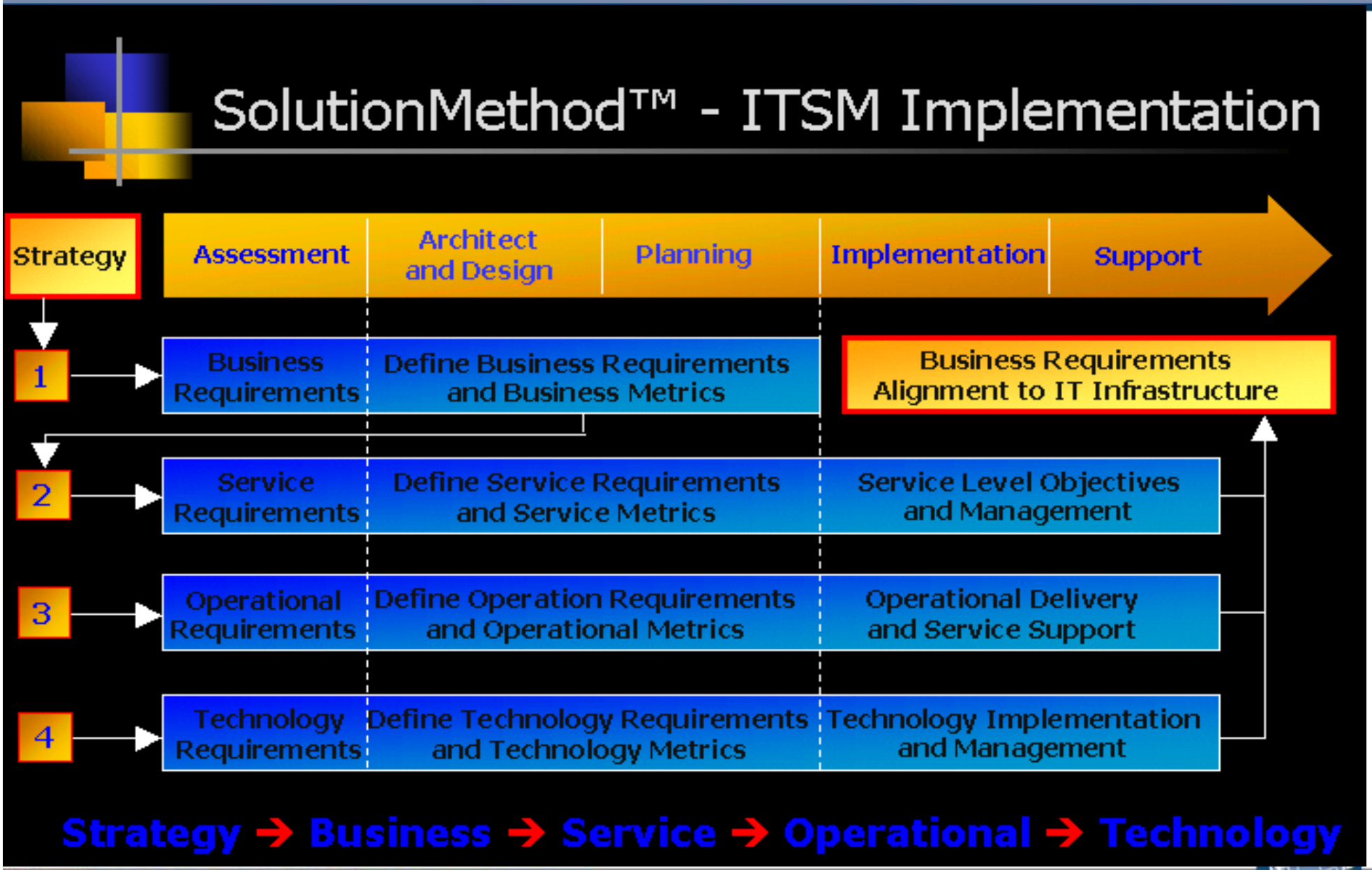
# Managing Customer Service

- IT Management - People
  - ITS/Technical personnel
    - Regular/budgeted training for technical competency/currency
      - Software Applications installation/use; Specific hardware installed/used
      - Regular/budgeting training on “softer skills”
      - Customer Service Skills
      - Grant Writing; Project Management; Budgeting/Contracts
      - Vendor partnering/relationship building
      - IT Security
    - ITSM – Information Technology Service Management (see Processes)
  - Non-ITS/Technical personnel
    - Regular/budgeted training on
      - LMS/CMS
      - PC/Internet use skills
      - Office productivity software proficiency; Other software/applications use
      - On-line & mobile collaboration tools
      - Engagement of ITS dept personnel (using ITSM)
  - Critical Success Factor(s)
    - Establish working relationships with IT personnel and end user/departments.
    - **TIME/TRAINING ALLOCATIONS FOR FUTURE TECH CHALLENGES/TRENDS**

# ITSM Components [16]



# Implementing ITSM



# *ITSM Methodology - Benefits*

- Better able to manage customer service requests
- Better able to manage change
- Ability to be more flexible and responsive to customer needs
- Provide consistent and stable IT services
- Provide highly available, safe/secure IT infrastructure
- Improve communication throughout the organization
- Improved Customer and User satisfaction
- Common language (for both tech and non-tech personnel)
- Deliver efficient and effective IT services in all areas/depts of an organization
- **Able to adapt to and address future IT Trends/Issues**

# *ITSM Methodology – Benefits – old vs. new*

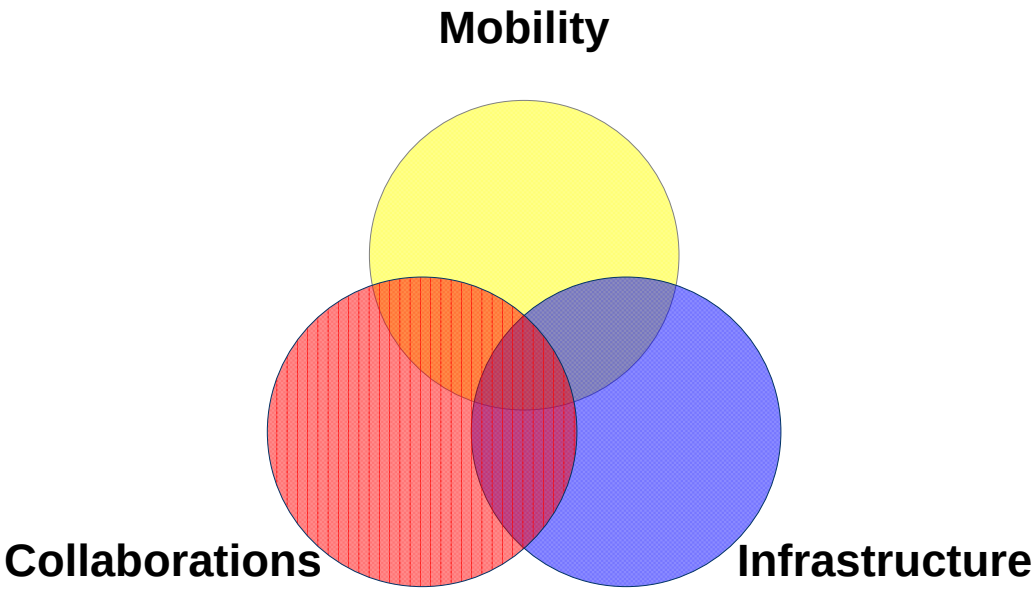
| **Traditional IT (old)** | **becomes** | **ITSM Process (new)** |
|---|---|---|
| **REACTIVE** | -> | **PROACTIVE** |
| “fire-fighting” | -> | Preventive |
| Technology Focus | -> | People/Process Focus |
| Users | -> | Customers |
| Centralized (access), done in-house, silos | -> | Distributed (access), sourced, integrated, enterprise-wide, self service |
| One-offs, ad-hoc, informal processes | -> | Repeatable, accountable, formal best practices |
| IT internal perspective | -> | Organization perspective |
| Operational specific | -> | Service Orientation |

# How to address the Tech Issues/Trends

- Aligning IT Strategic/Master Plan with all other organizational strategic/master plans
- Identify specific Tech Trends/Issues that are aligned with and support the advancement of other organizational goals/objectives.
- Articulate the targeted trends/issues in the IT Strategic/master plan goals and objectives
  - Based on priority/ranking, the organization will make the conscious decision to devote people, time and resources
- Example
  - SUNY Orange – Podcasting
    - Useful (addresses goals/objectives) for Academics -
    - Useful Adult continuing education/training
    - Useful for College communications/marketing
      - New students
      - Fund raising
      - Strategic communication needs

# *The Future…account for new/emerging technologies*

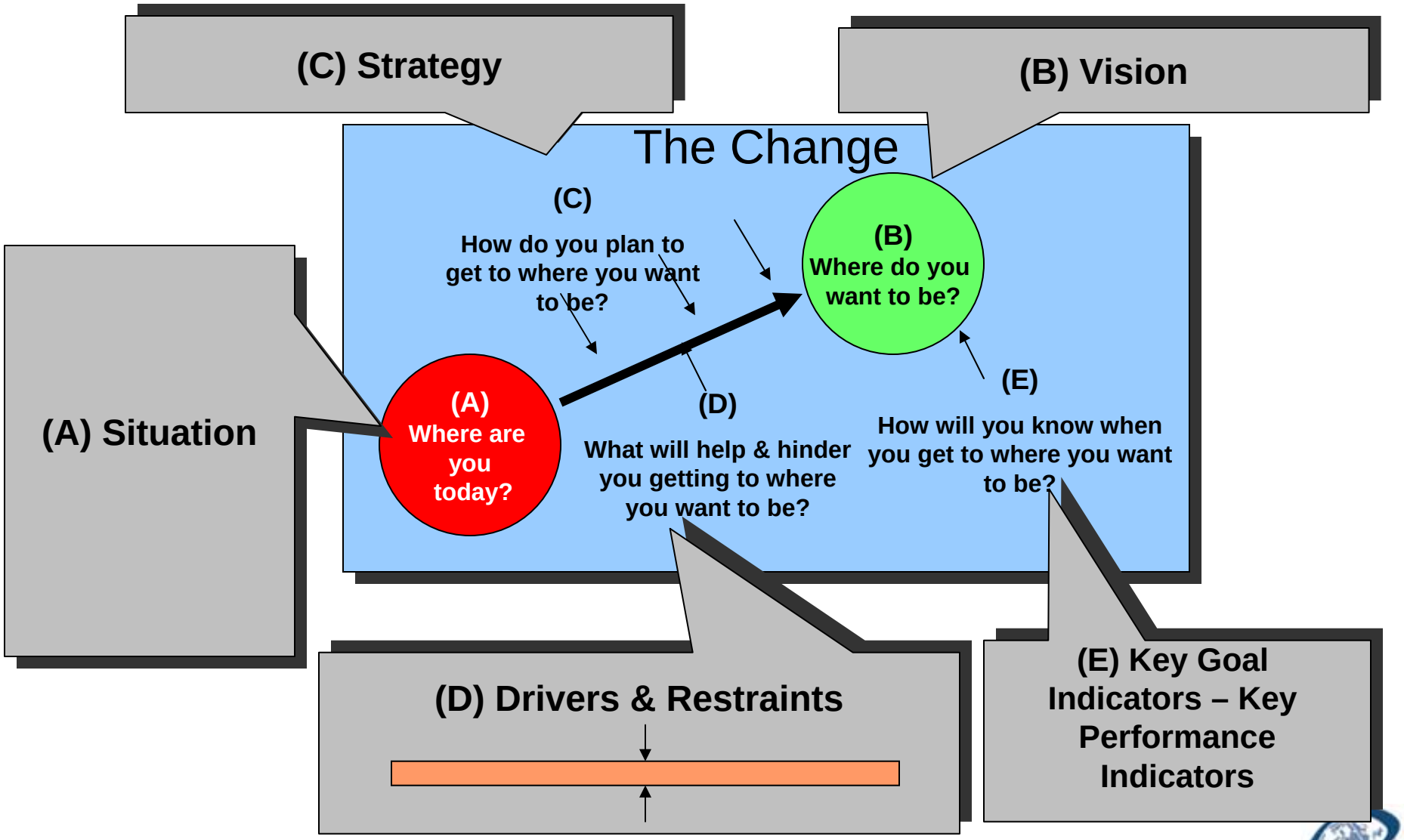
1. Infrastructure
2. Collaborations
3. Mobility




- RESULTS
  - Internet everywhere
  - Internet enabled devices
  - Migrations
  - Integrations, convergences
  - IT anywhere at anytime
  - IT SERVICES ANYTIME/ANYWHERE

# The Future…addressing the IT Trends/Issues

- Starts with planning, especially strategic planning (organization, integration)



# The Future – Planning for areas of the organization

**Inputs:**
- Current Situation (KPI – PPI/QCI); NCHEMS/CHESS
- Federal/State/Local Requirements
- Gen Ed Requirements
- Middle States Requirements
- External Accreditation
- Mission Review

(drivers)

(deliverables)

**Outputs:**
- Strategic Plan (Mission, Vision, Values, Goals)
- Academic Master Plan
  - Facilities Master Plan
  - Enrollment Master Plan
  - Student Development Master Plan
  - Adult Ed/Training Master Plan
  - IT Master Plan

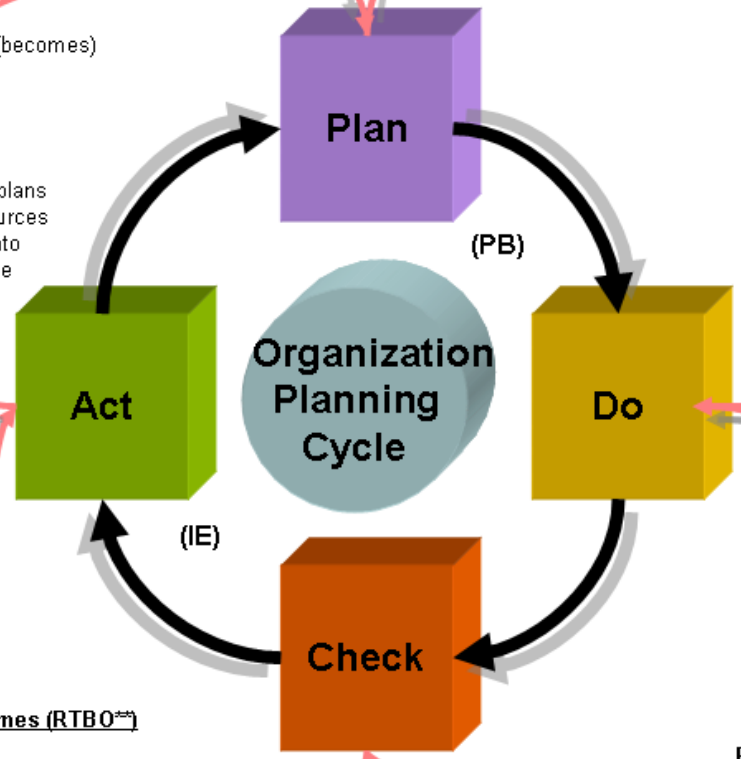
(each plan contains)

**Goals:**
- 1 or more objectives per goal
  - Are measurable
- Relate to previously developed
  - Key Performance Indicators
    - QCI
    - PPI
    - NCHEMS/CHESS

(developed into)

(becomes)

**Assessment-Outcomes**
- Decision to keep/continue/adjust plans
- Sunset/redeploy resources
- Output here is input into the next planning cycle




(decide)

(communicate & report)

(submittals)

(approved for execution)

**Project Plans/Proposals:**
- In support of 1 or more goals/objectives **(PTBS**)**
- Each has measurable KPI's
  - Schedule
  - Budget
  - Student Retention
  - Student Satisfaction
- Relate to previously developed
  - KPI; NCHEMS/CHESS
    - QCI
    - PPI

**Assessment-Outcomes (RTBO**)**
- KPI's
  - Schedule
  - Budget
  - Student Retention
  - Student Satisfaction
- Relate to previously developed
  - KPI; NCHEMS/CHESS
    - QCI
    - PPI

(measure)

(collect data of survey & stats)

**Project Implementation/Management/Coordination**
- Initiation
- Planning
- Execution
- Control
- Closing

****NOTE:**
**PTBS – Problem to be Solved**
**RTBO – Results to be Obtained**
**KPI – Key Performance Indicators**
**QCI - Qualitative Criteria Instrument**
**PPI – Program Prioritization Instrument**

# HIGHER EDUCATION – ISSUES/TRENDS

- Issues/Trends Effecting Higher Education
  - Aging Population
  - Work Age Population Decline
  - Rise of Asia – Population & Economic
  - Need to Close the Education/Skills Gap
  - Time Pressures
  - New Industries Requiring New Academic Programs/Training & Partnerships [8]
  - Increased Higher Education Competition
  - Increased Legal/Regulatory Requirements
  - **IT Trends/Challenges – points to the possible solution(s)**
    - Richard Garrett: Online higher ed clearly has moved from rhetoric to reality, from periphery to mainstream. If you look at people taking individual courses online, we now have 3.5 million at the last count, 20 percent of all students in U.S. higher education. If you segment people over 25, we think it is about 20 percent of people taking their whole higher education online. [19]

# Issues and Trends – UPDATE #1

- Other sources
- Biz-Tech 3.0 – Top 10 Disruptive IT Trends
  - 1. New Media
  - 2. Augmented Reality
  - 3. Social Networks
  - 4. Information Transparency
  - 5. Web Waves
  - 6. 3D Printing
  - 7. Molecular Computing
  - 8. Cloud Computing
  - 9. Semantics
  - 10. Web as Reasoning Engine
  - Reference: http://blogs.cioinsight.com/biztech30/content/future_of_it/top_10_disruptive_it_trends.html

# Issues and Trends – References UPDATE #1


- How Web 2.0 Can Reinvent Government - By Paula Klein - 2008-04-01
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# Part IV

## Q&A

# THANK YOU

James M. Dutcher - PMP, CISSP, SCP/Security+, CISA

SUNY Orange – Assoc. Vice President of Info. Tech. Services
845-341-4651 (office)

845-742-8954 (college cell)

607-760-7455 (personal cell)

james.dutcher@sunyorange.edu

jim@dutcher.net

# Notes and References


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- [16] "The Visible Ops Handbook"; by Kevin Behr, Gene Kim and George Spafford; IT Process Institute; 2004-2007; ISBN 978-0-9755686-1-3
- [17] http://www.itsm.info/solution.htm
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