Administrative Computing
CBMI Course CIS2261
July 30 - 31, 2018

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Some Issues for Today’s Class Discussion

- How can higher education institutions plan for and change the way it does business due to financial needs, changing needs/characteristics of students, changing workforce demographics and changes in technology?

- What are the key issues facing IT leadership in higher ed and where and how does administrative computing fit into the picture? How are CIO’s in higher ed viewing these issues? How about users of administrative applications?

- How should institutions plan for and manage administrative applications? Can institutions really protect sensitive institutional and personal information and privacy? Are administrative applications “in the cloud” viable and secure?

- How can information be managed as an institutional asset with so many pieces expected to be integrated and regularly changed?
What are the major concerns about the management of information in higher education?
What are the characteristics of a good management information system?
What are the keys to success?
What are the stumbling blocks to success?
What’s missing today?
What are the top ten IT issues facing your institution today?
CAUSE Postcard Survey:
IT Issues in the 1990's

Security Issues
Reengineering
Networking
Training and staff development
Aging Systems
Effectively coping with limited resources
Developing an IS strategic plan
Quality issues
Justifying the value of IS
Downsizing/Rightsizing
Client/Server
Aligning IT goals with university goals
Job security/loyalty
Other:
EDUCAUSE 2017: Top-Ten IT Issues

1. Information Security: Developing a holistic, agile approach to reduce institutional exposure to information security threats

2. Student Success and Completion: Effectively applying data and predictive analytics to improve student success and completion

3. Data-Informed Decision Making: Ensuring that business intelligence, reporting, and analytics are relevant, convenient, and used by administrators, faculty, and students

4. Strategic Leadership: Repositioning or reinforcing the role of IT leadership as a strategic partner with institutional leadership

5. Sustainable Funding: Developing IT funding models that sustain core services, support innovation, and facilitate growth

6. Data Management and Governance: Improving the management of institutional data through data standards, integration, protection, and governance

7. Higher Education Affordability: Prioritizing IT investments and resources in the context of increasing demand and limited resources

8. Sustainable Staffing: Ensuring adequate staffing capacity and staff retention as budgets shrink or remain flat and as external competition grows

9. Next-Gen Enterprise IT: Developing and implementing enterprise IT applications, architectures, and sourcing strategies to achieve agility, scalability, cost-effectiveness, and effective analytics

10. Digital Transformation of Learning: Collaborating with faculty and academic leadership to apply technology to teaching and learning in ways that reflect innovations in pedagogy and the institutional mission.
1. Information Security: Developing a holistic, agile approach to reduce institutional exposure to information security threats

2. Student Success: Managing the system implementations and integrations that support multiple student success initiatives

3. Institution-wide IT Strategy: Repositioning or reinforcing the role of IT leadership as an integral strategic partner of institutional leadership in achieving institutional missions

4. Data-enabled Institutional Culture: Using BI and analytics to inform the broad conversation and answer big questions

5. Student-centered Institution: Understanding and advancing technology’s role in defining the student experience on campus (from applicants to alumni)

6. Higher Education Affordability: Balancing and right-sizing IT priorities and budget to support IT-enabled institutional efficiencies and innovations in the context of institutional funding realities

7. IT Staffing and Organizational Models: Ensuring adequate staffing capacity and staff retention in the face of retirements, new sourcing models, growing external competition, rising salaries, and the demands of technology initiatives on both IT and non-IT staff

8. Data Management and Governance: Implementing effective institutional data governance practices

9. Digital Integrations: Ensuring system interoperability, scalability, and extensibility, as well as data integrity, standards, and governance, across multiple applications and platforms

10. Change Leadership: Helping institutional constituents (including the IT staff) adapt to the increasing pace of technology change
<table>
<thead>
<tr>
<th>Issue</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security</td>
<td>49%</td>
</tr>
<tr>
<td>Budget</td>
<td>20%</td>
</tr>
<tr>
<td>Staffing</td>
<td>12%</td>
</tr>
<tr>
<td>Innovation</td>
<td>6%</td>
</tr>
<tr>
<td>Disaster Recovery</td>
<td>6%</td>
</tr>
<tr>
<td>Leadership lack of understanding</td>
<td>3%</td>
</tr>
<tr>
<td>Demand exceeds supply</td>
<td>3%</td>
</tr>
<tr>
<td>ERP</td>
<td>3%</td>
</tr>
</tbody>
</table>
What is the one technology higher educations CIO's will have to invest in during the next 5 years?

- Analytics/Big Data: 23%
- Security: 19%
- Artificial Intelligence: 17%
- Cloud: 11%
- Network: 7%
- Virtual or augmented reality: 6%
- ERP: 6%
- Other: 5%
- Internet of things: 5%
- Disaster recovery/Business Continuity: 5%
- Adaptive learning: 4%
- Robotics: 2%
- People issues: 2%
- CRM: 2%
- Compliance: 2%
- Blockchain: 2%
Six Pillars of an Innovation Culture

1. **Strategy:** The CEO puts innovation on the agenda and "walks the talk", IT is strategic

2. **Values:** Innovation strategy is communicated. Risk-taking is encouraged. Failure is tolerated. Employees try maverick ideas.

3. **Workplace:** Employees work in an environment where they can:
   - Access people and information
   - Analyze or evaluate information and make viable, fast decisions
   - Be personally and collectively productive

4. **Management Commitment:** Important, influential people lead and manage innovation. They are committed to and accountable for making it work.

5. **Rewards:** Creative thinking skills are developed and valued. Great ideas are encouraged, evaluated, funded and rewarded. Building on the ideas of others is rewarded.

6. **"The Rules":** Are always subject to revision.
What Is Agility

Range-agility represents an organization's ability to broaden (or shrink) specific aspects of its capabilities and to propagate changes throughout the organization.

Time-agility consists of the time it takes to respond to and implement changes based on new market requirements.

Student Expectations Based on Consumerization

Internal and External Content
- Search and Discovery
- Content Management
- License Management
- Rights Management
- Linking

Authentication
- Single Sign-On

Security/Privacy

Personal Administrative Management (ERP)

E-portfolio

Personal Academic Management (CMS)

Communication Collaboration

Virtual Communities

24x7 Help

My Personal Device

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Brief history of electronic communications:

- 1836 telegraph
- 1866 transatlantic cable complete
- 1876 telephone
- 1957 Sputnik
- 1969 ARPANET commissioned
- 1971 people communication over ARPANET
- 1973 FTP and global networking begin
- 1977 email takes off, internet becomes reality
- 1981 BITNET
- 1991 WWW invented, 1993 WWW revolution begins
DIGITAL AROUND THE WORLD IN 2018

KEY STATISTICAL INDICATORS FOR THE WORLD’S INTERNET, MOBILE, AND SOCIAL MEDIA USERS

TOTAL POPULATION: 7.593 BILLION
INTERNET USERS: 4.021 BILLION
ACTIVE SOCIAL MEDIA USERS: 3.196 BILLION
UNIQUE MOBILE USERS: 5.135 BILLION
ACTIVE MOBILE SOCIAL USERS: 2.958 BILLION

URBANISATION: 55%
PENDENTRATION: 53%
PENDENTRATION: 42%
PENDENTRATION: 68%
PENDENTRATION: 39%

SOURCES: POPULATION: UNITED NATIONS; U.S. CENSUS BUREAU; INTERNET: INTERNETWORLDSTATS; ITU; EUROSTAT; INTERNETLIVESSTATS; CIA WORLD FACTBOOK; MIDEASTMEDIA.ORG; FACEBOOK; GOVERNMENT OFFICIALS; REGULATORY AUTHORITIES; REPUTABLE MEDIA; SOCIAL MEDIA AND MOBILE SOCIAL MEDIA: FACEBOOK; TENCENT; VKONTAKTE; KAKAO; NAYER; DING; TECHRASA; SIMILARWEB; KEPLOS ANALYSIS; MOBILE: GSMA INTELLIGENCE; GOOGLE; ERICSSON; KEPLOS ANALYSIS. NOTE: PENDENTRATION FIGURES ARE FOR TOTAL POPULATION (ALL AGES).
TIME SPENT PER DAY ON THE INTERNET

AVERAGE NUMBER OF HOURS SPENT USING THE INTERNET PER DAY VIA ANY DEVICE [SURVEY BASED]

JAN 2018

THAILAND: 9H 38M
PHILIPPINES: 9H 29M
BRAZIL: 9H 14M
INDONESIA: 8H 51M
SOUTH AFRICA: 8H 32M
MALAYSIA: 8H 27M
MEXICO: 8H 17M
ARGENTINA: 8H 12M
EGYPT: 8H 10M
TAIWAN: 7H 49M
U.A.E: 7H 49M
INDIA: 7H 25M
SINGAPORE: 7H 10M
TURKEY: 7H 09M
VIETNAM: 6H 52M
SAUDI ARABIA: 6H 45M
HONG KONG: 6H 31M
PORTUGAL: 6H 30M
CHINA: 6H 27M
HOLLAND: 6H 08M
ITALY: 6H 08M
NEW ZEALAND: 5H 59M
PAKISTAN: 5H 55M
SOUTH KOREA: 5H 51M
U.K.: 5H 34M
AUSTRIA: 5H 34M
SWEDEN: 5H 30M
IRELAND: 5H 20M
FINLAND: 5H 19M
AUSTRALIA: 5H 04M
SPAIN: 5H 03M
BELGIUM: 5H 03M
GERMANY: 4H 52M
FRANCE: 4H 48M
JAPAN: 4H 12M
NIGERIA: 4H 05M
KENYA: 3H 50M
CHINA: 3H 46M
MOROCCO: 2H 53M

SOURCE: GLOBALWEBINDEX, Q2 & Q3 2017, BASED ON A SURVEY OF INTERNET USERS AGED 16-64.
TIME SPENT ON SOCIAL MEDIA

AVERAGE NUMBER OF HOURS THAT SOCIAL MEDIA USERS SPEND USING SOCIAL MEDIA EACH DAY VIA ANY DEVICE [SURVEY BASED]

SOURCE: GLOBALWEBINDEX, Q2 & Q3 2017. BASED ON A SURVEY OF INTERNET USERS AGED 16-64.
Most famous social network sites worldwide as of April 2018, ranked by active users (in millions)

- Facebook: 2,234
- Instagram: 813
- WeChat: 980
- QQ: 783
- Qzone: 563
- Sina Weibo: 392
- Twitter: 330
- Reddit: 330
- Skype: 300
- Baidu Tieba: 300
- LinkedIn: 260
- YouTube: 1,500
- Facebook Messenger: 1,300
- WhatsApp: 1,500
- Facebook: 1,300
- YouTube: 1,500
- LinkedIn: 2,234

© Statista 2018
According to advertising agency McCann in Australia, 77 percent of Australians fly less than three times a year because it's too expensive. So it created the "Infrequent Flyers" club for client Tigerair, "the rewards program that gives you absolutely nothing at all," according to a film on the agency's website. The club now has 500,000 members and generated AU $2 million ($1.5 million) in sales in three months.
Some problems with social media…

It might make you spend more money...

It alters your appetite

It messes with your ability to think independently

It hurts your self-esteem

It can “butcher” real-life conversations

Recent Reader’s Digest article using research from Columbia University, Oxford University, several German universities, Women’s Health and HP Labs
Cornell Information Science published research in December, 2015 that looked at (among other things) the difficulty some people have in quitting Facebook and other social networks. They even have a label for the failure to quit: “Social Media Reversion.”

**Social Media Anxiety Disorder** is a syndrome that relates to generalized Social Anxiety, and is acquired when the participation of social media affects the mental and physical well-being of an individual...After depression and [alcoholism](#), Social Anxiety Disorder is considered as the third leading psychological disorder in the US. **Pramod Kerkar**, MD, April 4, 2017
Anyone worried?

Reddit CEO Steve Huffman: “We know your dark secrets. We know everything.”
Planning IT Leadership for the Future...

"Best" Practices
• Recruit from within
• Strengthen ongoing IT training opportunities
• Challenge current IT staff
• Invest in professional development
• Build opportunities to transfer knowledge from older to younger workers

CIO Strategies
• Look for opportunities to mentor
• Hire/retain retirees as short-term solution but only if you can transfer knowledge
• Establish an "advanced technology group" to explore/monitor new and emerging technologies
• Remember a bad hire is far worse than no hire!
Digital Natives In the Workforce

"There aren't any icons to click. It's a chalk board."

BECING FIVE  A BOY AND HIS BLOG

I'm a digital native, which means I was born in the age of technology...so it comes natural to me!

My parents are digital immigrants, which means they can learn technology, but they have to work at it!

And my grandparents are digital retards, which means they barely know how to use a toaster!
Digital Culture War: Digital Natives (as Learners) and Digital Immigrants (as Teachers) Research*

<table>
<thead>
<tr>
<th>Digital Native Learners</th>
<th>Digital Immigrant Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prefer receiving information quickly from multiple multimedia sources.</td>
<td>Prefer slow and controlled release of information from limited sources.</td>
</tr>
<tr>
<td>Prefer parallel processing and multitasking (multiplexing?).</td>
<td>Prefer singular processing and single or limited tasking.</td>
</tr>
<tr>
<td>Prefer processing pictures, sounds and video before text.</td>
<td>Prefer to provide text before pictures, sounds and video.</td>
</tr>
<tr>
<td>Prefer random access to hyperlinked multimedia information.</td>
<td>Prefer to provide information linearly, logically and sequentially.</td>
</tr>
<tr>
<td>Prefer to interact/network simultaneously with many others.</td>
<td>Prefer students to work independently rather than network and interact.</td>
</tr>
<tr>
<td>Prefer to learn &quot;just-in-time.&quot;</td>
<td>Prefer to teach &quot;just-in-case&quot; (it's on the exam).</td>
</tr>
<tr>
<td>Prefer instant gratification and instant rewards.</td>
<td>Prefer deferred gratification and deferred rewards.</td>
</tr>
<tr>
<td>Prefer learning that is relevant, instantly useful and fun.</td>
<td>Prefer to teach to the curriculum guide and standardized tests.</td>
</tr>
</tbody>
</table>

*Ian Jukes and Anita Dosaj, The InfoSavvy Group, February 2003
What are the characteristics of Gen Z?

1. Gen Z Is Motivated By Security

These young people were still kids during the Great Recession, which means that they may have seen their parents take huge financial hits. A significant portion of their lives may have been defined by struggles related to that. While millennials are often seen as more idealistic, and more motivated by purpose than a paycheck, Generation Z may lean more toward security and money. This is a pragmatic generation — they care about making a difference, but are ultimately motivated by ensuring they have a secure life outside of work.

If you’re looking to recruit members of Generation Z, you may be able to tempt them with promises of job security and raises down the line.

2. Gen Z May Be More Competitive

As a cohort, millennials are said to be collaborative and teamwork oriented. They want to work in an environment where inclusion is a priority, and where everybody works together to advance goals. Gen Z, on the other hand, is said to be defined by its competitiveness. They want to work on their own and be judged on their own merits rather than those of their team. Gen Z also understands that there’s a need for constant skill development in order to stay relevant. Their parents likely taught them the importance of working hard, and that no one will hand them their success. This generation is willing to work hard, but they expect to be rewarded for it.
What are the characteristics of Gen Z?

3. Gen Z Wants Independence

Gen Zers’ independence ties into their competitiveness, but they generally like to work alone. Many of them prefer to have office space to themselves, rather than an open, collaborative workspace. Many also want to manage their own projects so that their skills and abilities can shine through. They do not want to depend on other people to get their work done. This independence is apparent in the higher education choices some Gen Zers make. More of them are skipping higher education than their millennial counterparts, and moving straight into the workforce. They’d rather avoid the years of debt and try one of the newer, more affordable options. Don’t disregard a potentially great employee just because they don’t have the credentials you usually look for — they might have all of the skills you need, just from a different source.

4. Gen Z Will Multitask (More Than Millennials)

If you thought your millennial employees were easily distracted, always flipping between texts and emails, just wait until you start working with members of Gen Z! These young people have always lived in a connected world, and they’re used to constant updates from dozens of apps. Switching between different tasks and paying simultaneous attention to a wide range of stimuli comes naturally to them. This can be perfect for a workplace that requires multitasking. If you’re looking for employees who can focus deeply on a task for a long period of time, make sure that’s communicated to potential Gen Z employees. And, if you see them looking at their phone during work hours, don’t assume that will distract them for ages — they’re used to spending five seconds checking for updates before returning to the task at hand. This group of employees might start working on a document in the afternoon, open it on their phone on the subway ride home and pull it up again on their laptop while watching TV. They don’t have as much of a harsh delineation between work and home, and this could change the workplace even more in the coming years.
What are the characteristics of Gen Z?

5. Gen Z Is More Entrepreneurial

Generation Z is 55% more likely to want to start a business than millennials. In fact, a full 72% of Gen Z high school students say that they want to start a business. This can be tied back to many of their traits — especially the independence and desire for financial success. They are highly motivated and willing to work hard to achieve their dreams. These budding entrepreneurs can make great employees. They are likely to soak up as much knowledge as they can and take on many different challenges as they pursue their goal of starting their own company in the future.

6. Gen Z Wants To Communicate Face To Face

You may have just gotten used to your millennial employees preferring to communicate over email or Slack, but be prepared to switch it up again. Generation Z likes to talk face to face. Fifty-three percent of Generation Z said they prefer in-person discussion over instant messaging or email. This can be attributed to the negative attention they’ve seen millennials receive for their reliance on technology, or because the technology they’ve grown up with (Skype, Snapchat) has allowed people to communicate with a full range of sound and motion, instead of just text. Be prepared for regular in-person meetings with your Gen Z employees to discuss their projects as well as their professional development.
What are the characteristics of Gen Z?

7. Gen Z Are True Digital Natives

Millennials have long been described as digital natives, but they actually grew up in a world that was still full of landlines and dial-up internet. They’re used to progress taking time, and are just as confused by some of the newest apps as baby boomers are. Gen Z, on the other hand, has been living in a world of smartphones and free Wi-Fi for as long as they can remember. Ninety-two percent of them have some sort of digital footprint. They easily flit between platforms and technologies and pick up new software quickly. Their relationship to technology may be even more instinctual than that of a millennial in their late 30s.

8. Gen Z Wants To Be Catered To

Gen Zers expect the workplace to conform to their needs. They are similar to millennials in this way, and are actually fairly similar to boomers as well. This attitude is having an effect on the workplace. In recent years, stars such as U2 and Bruno Mars performed at Salesforce’s annual conference. A decade ago, a huge company would never have hired a rock band to appeal to young people. Now, it’s pretty typical to have young attendees in mind.

There are some clear generational differences between millennials and the young people just entering the workplace today. Of course, every member of a generation is an individual and will have their own unique traits, but keeping these generalizations in mind could help you prepare to welcome this new generation to the working world.
What Can/Should We Do About the Aging of Our Workforce

- Analyze the demographics of your campus workforce and compare with local, regional, national and global demographics
- Brainstorm on creative ways to recruit young faculty/staff, with an understanding of generational characteristics
- Look for opportunities to transfer knowledge/experiences
- Review HR policies and practices and work to change for IT where necessary
- Explore ways to retain key people past retirement
List all of the applications that are included in administrative computing for a college/university
How important is integration and which apps must be integrated and why?
Which of the following best describes your core administrative applications (financials, student systems, human resources, advancement)

- Outsourced: 1% (2014), 1% (2015), 2% (2016)
- Open-source: 0% (2014), 0% (2015), 0% (2016), 0% (2017), 1% (2018)
- Other: 4% (2014), 5% (2015), 9% (2016), 5% (2017), 5% (2018)
2018 LBCIO Survey Data:

Please check which best applies to the particular modules:

- Grants Management: 69% Vendor Supplied, 25% Home Grown, 5% Outsourced, 2% Open Source, 2% Vendor Supplied
- Advancement: 90% Vendor Supplied, 5% Home Grown, 4% Outsourced, 1% Open Source, 1% Vendor Supplied
- Payroll: 90% Vendor Supplied, 7% Home Grown, 5% Outsourced, 2% Open Source, 0% Vendor Supplied
- Human Resources: 92% Vendor Supplied, 5% Home Grown, 4% Outsourced, 0% Open Source, 0% Vendor Supplied
- Financial Aid: 94% Vendor Supplied, 5% Home Grown, 2% Outsourced, 0% Open Source, 0% Vendor Supplied
- Student Registration, grading, transcripting: 91% Vendor Supplied, 8% Home Grown, 1% Outsourced, 0% Open Source, 0% Vendor Supplied
- Financials (GL, AP, AR...): 91% Vendor Supplied, 6% Home Grown, 2% Outsourced, 1% Open Source, 1% Vendor Supplied
When will you likely replace or make a major upgrade to the following

- Grants Management:
  - More than 6 years: 23%
  - 4-6 Years: 23%
  - Next 2-3 years: 26%
  - In process: 29%

- Advancement:
  - More than 6 years: 23%
  - 4-6 Years: 25%
  - Next 2-3 years: 25%
  - In process: 28%

- Payroll:
  - More than 6 years: 21%
  - 4-6 Years: 25%
  - Next 2-3 years: 25%
  - In process: 28%

- Human Resources:
  - More than 6 years: 24%
  - 4-6 Years: 23%
  - Next 2-3 years: 24%
  - In process: 31%

- Financial Aid:
  - More than 6 years: 20%
  - 4-6 Years: 25%
  - Next 2-3 years: 26%
  - In process: 29%

- Student Registration, grading, transcripting:
  - More than 6 years: 20%
  - 4-6 Years: 25%
  - Next 2-3 years: 25%
  - In process: 31%

- Financials (GL, AP, AR…):
  - More than 6 years: 23%
  - 4-6 Years: 25%
  - Next 2-3 years: 28%
  - In process: 30%
What about BPR?

How important is Business Process Reengineering at your institution?

- Not Important: 8% (2015), 6% (2016), 6% (2017), 8% (2018)

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2018 LBCIO Survey Results: Shadow Systems

Shadow systems are:

- **Likely to diminish in importance in the future**
  - 2014: 8%
  - 2015: 10%
  - 2016: 9%
  - 2017: 11%
  - 2018: 10%

- **Likely to grow in the future**
  - 2014: 4%
  - 2015: 3%
  - 2016: 4%
  - 2017: 3%
  - 2018: 3%

- **Growing in number**
  - 2014: 11%
  - 2015: 12%
  - 2016: 13%
  - 2017: 19%
  - 2018: 11%

- **About the same**
  - 2014: 35%
  - 2015: 36%
  - 2016: 31%
  - 2017: 36%
  - 2018: 35%

- **Fewer than a few years ago**
  - 2014: 41%
  - 2015: 41%
  - 2016: 37%
  - 2017: 38%
  - 2018: 40%
What are the strengths of your current systems (either home-grown or custom, proprietary or best of breed)
What are the weaknesses of your current systems (either home-grown or custom, proprietary or best of breed)
Match Investments to Technology Adoption Personality

Number of Organizations

High Technology Assimilation Low

A  B  C
Do not adopt just because it is "hip"

Do not reject just because it is "out"

Positive Hype

Negative Hype

Technology Trigger

Peak of Inflated Expectations

Trough of Disillusionment

Slope of Enlightenment

Plateau of Productivity

Maturity

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Watching Technologies on the Hype Cycle

Type A
Peak of Inflated Expectations
Trough of Disillusionment
Slope of Enlightenment
Plateau of Productivity

Type B

Type C

Technology Trigger

Organization Type and Usage

Visibility

Time
Watching Technologies on the Hype Cycle

- **Type A**
  - Technology Trigger
  - Peak of Inflated Expectations
  - Trough of Disillusionment
  - Slope of Enlightenment
  - Plateau of Productivity

- **Type B**
  - Visibility

- **Type C**

**Organization Type and Usage**

**Time**
Framework for Managing Technology Adoption in Higher Education

Chaotic Sandpit

Healthy Hothouse

Disciplined Engine Room

Technology Trigger
Peak of Inflated Expectations
Trough of Disillusionment
Slope of Enlightenment
Plateau of Productivity

Adoption

Administration
Not in Use
Watch
Plan
Pilot
Adopt
Use

Teaching/Learning
Experiment
Play
Focused Use
Enable
Broad Use
Leverage

Research
Conceptualize
Build
Contribute
Commercialize
Sell
Exit Research
Use

Focus
Leverage
Enable
Plan
Pilot
Adopt
Use

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Adopt Technologies at Different Stages of Maturity

- **Chaotic Sandpit**
  - Conceptualize
  - Build

- **Healthy Hothouse**
  - Contribute
  - Commercialize

- **Disciplined Engine Room**
  - Sell
  - Exit Research

---

**Life Cycle**

- **Adoption**
- **Transition**
- **Maturity**

- **Administration**
  - Not in Use
  - Watch
  - Plan
  - Pilot
  - Adopt
  - Use

- **Teaching/Learning**
  - Experiment
  - Play
  - Focused Use
  - Enable
  - Broad Use
  - Leverage
  - Use

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## Designing the Solution Inferred From Current Architectural Principles

<table>
<thead>
<tr>
<th>Principles</th>
<th>Chaotic Sandpit</th>
<th>Healthy Hothouse</th>
<th>Disciplined Engine Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stickiness</td>
<td>Freedom</td>
<td>&quot;Recommended&quot;</td>
<td>&quot;Approved&quot;</td>
</tr>
<tr>
<td>Accessibility</td>
<td>Access anyone</td>
<td>Broad policies</td>
<td>Access monitored &amp; controlled</td>
</tr>
<tr>
<td>Adaptability</td>
<td>Informal</td>
<td>Requirements</td>
<td>Requirements formally managed</td>
</tr>
<tr>
<td>Interoperability</td>
<td>Not mandated</td>
<td>Recommended</td>
<td>Mandated</td>
</tr>
<tr>
<td>Security &amp; Privacy</td>
<td>Low to nonexistent</td>
<td>As appropriate</td>
<td>Mandated by policy</td>
</tr>
</tbody>
</table>

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<tbody>
<tr>
<td><strong>Partnering</strong></td>
<td>Innovation</td>
<td>Share and reuse</td>
<td>Use existing applications &amp; infrastructure</td>
</tr>
<tr>
<td><strong>Reusability</strong></td>
<td>Not necessary</td>
<td>Encouraged</td>
<td>Mandated</td>
</tr>
<tr>
<td><strong>Serviceability</strong></td>
<td>None</td>
<td>Limited</td>
<td>Formal service-level agreements in place</td>
</tr>
<tr>
<td><strong>Manageability</strong></td>
<td>Not necessary</td>
<td>Appropriate levels</td>
<td>Mandated service-level agreements</td>
</tr>
<tr>
<td><strong>Integrity</strong></td>
<td>No practices in place</td>
<td>Some practices in place</td>
<td></td>
</tr>
</tbody>
</table>

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How about putting all administrative applications in the cloud? (What is cloud computing, anyway?)

**Gartner** defines **cloud** computing as a style of computing in which scalable and elastic IT-enabled capabilities are delivered as a service using Internet technologies.
What are the differences/similarities between cloud computing, ASP, and SaaS?

Gartner defines software as a service (SaaS) as software that is owned, delivered and managed remotely by one or more providers. The provider delivers software based on one set of common code and data definitions that is consumed in a one-to-many model by all contracted customers at anytime on a pay-for-use basis or as a subscription based on use metrics.

An application service provider (ASP) is defined as an enterprise that delivers application functionality and associated services across a network to multiple customers using a rental or usage-based transaction-pricing model. Gartner defines the ASP market as the delivery of standardized application software via a network, though not particularly or exclusively the Internet, through an outsourcing contract predicated on usage-based transaction pricing. The ASP market is composed of a mix of service providers (Web hosting and IT outsourcing), independent software vendors and network/telecommunications providers.
Why are we interested in cloud-based apps and who’s delivering?

Ellucian: “The cloud: a smart move for higher education”

WorkDay: The world’s leading organizations trust Workday as their enterprise cloud suite, supporting breakthrough results in finance and HR across a wide range of challenges and industries.

Oracle/PeopleSoft: “Oracle Student Cloud An Innovative, New Product for Today’s Learners in Higher Education”

Jenzabar “Product Sheet: Jenzabar Cloud Services IT Hosting for Higher Education”

Kuali “A Case for SaaS and Cloud Computing in Higher Education”
If you use an ERP solution, which vendor(s) do you use (check all that apply)?

- Best of breed: 5%
- Home grown: 6%
- WorkDay: 10%
- SAP: 4%
- Oracle/PeopleSoft: 31%
- Kuali: 2%
- Jenzabar: 5%
- Elluciaon (Banner, Colleague, PowerCampus): 59%
- Campus Management: 1%
Why are we interested in cloud-based apps and who’s delivering?

*Kuali website Q&A:*

**P.A. Lamping**

*June 12, 2015 at 10:09 am*

The “Cloud” business model has an inherent flaw in terms of privacy and ownership of private data, in that the cloud company now becomes an owner of our private data.

Even if the cloud company has agreements saying otherwise, by law the cloud company does have ownership. If the data sits on your servers, you are an owner.

**Chris Coppola**

*June 15, 2015 at 4:36 pm*

Thanks for your comment Paul. Data ownership is indeed an issue worth paying close attention to as more businesses, including colleges and universities, put more data in cloud services. With regard to the cloud services we offer, we make it very clear that our customers own and retain all rights and interest in their data. As a cloud provider we simply obtain the limited right (license) to use their data to perform the service. No ownership is transferred to us. We go a step further with our open source license to ensure that not only can a customer walk away with their data, but with the software and source code required to make that data useful as well.

Our goal is to provide a safe and secure service for our customers. If there are specific laws you think we should be aware of in order to deliver on that objective, please let us know.
Which of the following areas are you either currently placing in the cloud or are in the process of placing in the cloud (check all that apply)

- Other (please specify)
- Video security
- Research management and support
- Business continuity/disaster recovery
- Records Management
- Content Management
- Data storage
- CRM
- Course/Learning Management (LMS or CMS)
- Student applications (enrollment management, registration…)
- Financial applications
- Alumni applications
- Library applications
- Desktop tools (i.e. MS Office)
- Data center
- Portal
- Social networking
- Mail
Which best describes your cloud policies for software, services and platforms? (Check all that apply)

- We have policies and procedures that are strictly followed and updated regularly
- We have some policies and procedures in place that are strictly followed but are working on them at this time
- We are working on policies and procedures
- Our policies and procedures are loosely defined and are more suggestions
- Don't have institution wide policies and procedures
- Other (please specify)
Cloud Computing: 2018 LBCIO Survey

Which Of The Following Are You Currently Using Or Considering

- Amazon Web Services: 77% (2018), 71% (2017)
- Microsoft Azure: 70% (2018), 66% (2017)
- IBM: 6% (2018), 4% (2017)
- Oracle: 19% (2018), 11% (2017)
- Other (please specify): 5% (2018), 6% (2017)
What About Shared Services? What are they and what are the opportunities/threats?
Characteristics of Shared Services

Create a customer and service orientation, which drives more business-oriented behaviors among IT workers and improves relationships.

Provide process rationalization, repeatability and predictability, which improve service levels and costs.

Reduce redundancy and complexity, which further drive down costs and improve reliability.

Improve the use of scarce, often expensive, resources.
Some HE examples of Shared Services

Associated Colleges of Central Kansas (ACCK)
California State University PeopleSoft Project
University of North Carolina Shared Services Alliance
University of Wisconsin Medical Center
Drexel University Model
Legend 1: As soon as the implementation has “gone live,” the enterprise is “done” deploying ERP.

Legend 2: We will go “plain vanilla” to save money and time.

Legend 3: Big vendors are more stable than little vendors.

Legend 4: If we have executive go-ahead to implement an ERP, it must be everyone’s top priority.

Legend 5: Overpromising and agreeing to all user demands will keep them happy.
Steady-State ERP Costs for Higher Education

What CEOs and others expect to spend

What happens with customization

What really happens

What some vendors tell you

Implementation Period

Time
When Should Optimization Mean Customization?

Emerging Process Area

Assembled

Delivered

Mature Process Area

No Competitive Advantage

Clear Competitive Advantage

Customized

Tweaked

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“Without this, students won’t graduate.”

“Those processes have to be on one screen.”

“But that button was yellow before!”

Amplitude of Business Impact

Mission-Critical

Mission-Neutral

Department/Line of Business Contribution

Institution/System Contribution

Below Value Threshold

Department

Institution+

Breadth of Business Impact

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Customization vs. Configuration
Fully Configurable vs. Pre-Configured

What is the difference between these block hotels?
1. Decide which disciplines you can bring, then seek “delta” from ESP
2. Depending on range and volume of skills needed, decide on large, boutique ESP or application vendor staff or both
3. Factor culture, innovations (e.g., competency centers), contracting flexibility in ESP selection
4. Link performance to results
5. Demand detailed work plans with specific deliverables, assumptions and so on
6. Monitor progress diligently
7. Reward for outcomes, not just time and materials
ROI - the challenge for Higher Ed.

- Traditional ROI methods do not apply
- How justify?
  - Improved effectiveness
  - Increase efficiency
  - Lowered costs
Specific Questions - Implementation

- How long should we expect the project to take and how much will it cost?
- Most common risks and how to avoid them
  - Comment on the importance of strong executive sponsorship to the success of a project
- Best practices approach to Needs Assessments
- Best practices approach to RFP/RFI creation
- Any comments to a "big bang" approach vs. a phased implementation approach
Specific Questions - Implementation

- How long should we expect the project to take and how much will it cost?
- Most common risks and how to avoid them
  - Comment on the importance of strong executive sponsorship to the success of a project
- Best practices approach to Needs Assessments
- Best practices approach to RFP/RFI creation
- Any comments to a "big bang" approach vs. a phased implementation approach
Q: How long should we expect the project to take and how much will it cost?

A: It Depends...

...on Scope

- Locations
- Processes/Functions
- Custom requirements/interfaces

- Resources
  - Time
  - People
  - Money
Specific Questions - Implementation

- How long should we expect the project to take and how much will it cost?

- Most common risks and how to avoid them
  - Comment on the importance of strong executive sponsorship to the success of a project

- Best practices approach to Needs Assessments

- Best practices approach to RFP/RFI creation

- Any comments to a "big bang" approach vs. a phased implementation approach
Is Your Project at Risk?  
Factors to Consider

Examples of how a simple test can indicate enterprise vulnerability:

<table>
<thead>
<tr>
<th>Factor</th>
<th>Indicator 1</th>
<th>Indicator 2</th>
<th>Indicator 3</th>
<th>Indicator 4</th>
<th>Indicator 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partner roles well-defined</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Partner relationships are well-managed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Partners collaborate effectively</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Few partners/vendors</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Virtual team processes are clearly defined</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

- **High Risk Score** = More Than 17
- **Low Risk Score** = Less Than 13
Assign Ownership/Accountability for Risk Management

Project Timeline

Plan

Design

Develop

Implement

Risk Management Activities

Assess

Risk Management Plan

Monitor

Within threshold

Above threshold

Containment strategy

Communicate

Notification of high risk

Implement containment strategy

Evaluate corrective actions

Communicate exposure

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### Monitor Risk Throughout the Project

#### Metrics | Sample Thresholds for Change
--- | ---
**Target dates** | Date extensions accumulate to more than two weeks
**Scope** | Any change in requirements — zero tolerance!
**Quality** | Any reduction in testing, training, or review of work efforts — zero tolerance!
**Cost** | Cumulative cost increases of 20 percent over estimate
**Resources** | Resource increase/decrease more than 20 percent. Change in critical resources

*Identify key metrics that quantify impact to the project. Give decision makers a clear picture of outcomes if the risk is not contained.*

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Specific Questions - Implementation

- How long should we expect the project to take and how much will it cost?
- Most common risks and how to avoid them
  - Comment on the importance of strong executive sponsorship to the success of a project
- Best practices approach to Needs Assessments
- Best practices approach to RFP/RFI creation
- Any comments to a "big bang" approach vs. a phased implementation approach
ERP Vendor Selection ‘Environmental Challenges’

- Lack of structure and methodology
  - Wasted time and effort reinventing the wheel
- Political agendas and predetermined outcome
  - Objectivity is destroyed, suboptimal choices made
- Analysis paralysis
  - Too much time taken or no decision ever reached
- Lack of validated information
  - Implementation failures and ballooning costs
ERP Vendor Selection
‘Challenges in Execution’

- Identify appropriate differentiating criteria
- Structure criteria into appropriate context
- Assign relative importance within this structure
- Gather and validate objective vendor information
- Justify the selection throughout the organization
Institutions spend up to 25 percent of the overall software acquisition cost and 30 percent of the installation time in the selection process.
Selection Methodology

The Three Phases of Vendor Selection:

1. Internal Needs Assessment
2. Vendor Analysis
3. Negotiation and Selection
Specific Questions - Implementation

- How long should we expect the project to take and how much will it cost?
- Most common risks and how to avoid them
  - Comment on the importance of strong executive sponsorship to the success of a project
- Best practices approach to Needs Assessments
- Best practices approach to RFP/RFI creation
- Any comments to a "big bang" approach vs. a phased implementation approach
Security and Privacy, how important?
How would you describe your campus culture in supporting good practices toward IT Security? For instance, faculty and students are aware of their role in preventing various attacks.
How likely do you think a potential security breach could damage the institution's reputation? For instance, an attack successfully steals student data, hurting marketing and enrollment.
What is your faculty's appreciation for security controls-policies, passwords, multi-factor, cloud, data access, etc. (check all that apply)?

- They are necessary and must be followed: 39%
- They are useful but just guidelines: 65%
- They impede academic freedom and/or creativity: 35%
Some faculty have complained that extreme IT security and data safeguards can impede academic freedom. How much do you agree with that concern?

- Totally: 1%
- Mostly: 6%
- Somewhat: 52%
- Not at all: 41%
Security will continue to be an issue…
LBCIO Survey Results from 2014 - 2018

Do you have a formal IT Security plan?

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>51%</td>
<td>51%</td>
<td>56%</td>
<td>59%</td>
<td>60%</td>
</tr>
<tr>
<td>No</td>
<td>16%</td>
<td>17%</td>
<td>17%</td>
<td>17%</td>
<td>16%</td>
</tr>
<tr>
<td>Working on one</td>
<td>20%</td>
<td>25%</td>
<td>24%</td>
<td>28%</td>
<td>28%</td>
</tr>
</tbody>
</table>

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How has the percentage of IT spend on security changed over the past five years?

- **Increased**
  - 2014: 71%
  - 2015: 76%
  - 2016: 77%
  - 2017: 71%
  - 2018: 78%

- **Decreased**
  - 2014: 5%
  - 2015: 3%
  - 2016: 3%
  - 2017: 3%
  - 2018: 3%

- **Stayed the same**
  - 2014: 24%
  - 2015: 19%
  - 2016: 19%
  - 2017: 18%
  - 2018: 26%

- **Don’t know**
  - 2014: 1%
  - 2015: 0%
  - 2016: 2%
  - 2017: 1%
  - 2018: 1%
2018 LBCIO Survey Results

Do you have a plan to resume mission critical operations in case of a crisis?

- Yes: 82% (2018), 81% (2017), 80% (2016), 81% (2015), 82% (2014)
- No: 6% (2018), 4% (2017), 6% (2016), 6% (2015), 5% (2014)
- Not yet but in process: 12% (2018), 14% (2017), 15% (2016), 12% (2015), 5% (2014)
Do you have a fully redundant data center, where you could get all your systems up and running in less than a week?

- Yes, fully:
  - 2014: 24%
  - 2015: 28%
  - 2016: 27%
  - 2017: 27%
  - 2018: 30%

- Yes, partially:
  - 2014: 48%
  - 2015: 43%
  - 2016: 43%
  - 2017: 41%
  - 2018: 35%

- Planning stage:
  - 2014: 10%
  - 2015: 12%
  - 2016: 8%
  - 2017: 7%
  - 2018: 14%

- No:
  - 2014: 18%
  - 2015: 23%
  - 2016: 18%
  - 2017: 18%
  - 2018: 25%

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Are easier to manage and protect against than in the past few years

- 2016: 5%
- 2017: 2%
- 2018: 4%

Are about the same to manage and protect against as in the past few years

- 2016: 17%
- 2017: 20%
- 2018: 21%

Are more difficult to manage and protect against than in the past few years

- 2016: 72%
- 2017: 74%
- 2018: 72%

Keep me awake at night

- 2016: 24%
- 2017: 26%
- 2018: 31%
Phishing Incidents:

- **Are getting easier to manage**: 4% (2017), 12% (2018)
- **Staying about the same**: 40% (2017), 49% (2018)
- **Are getting more difficult to manage**: 4% (2017), 39% (2018), 55% (2018)
Managing Phishing (Check all that apply)

- We have policies and guidelines to help protect against phishing attacks: 64% (2017), 64% (2018)
- We have training programs for managing phishing: 64% (2017), 69% (2018)
- We have good software to control phishing: 54% (2017), 61% (2018)
- Other (please specify): 9% (2017), 8% (2018)

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Ransomware attacks:

- Are not a problem yet: 46% in 2017, 55% in 2018
- Are getting worse: 45% in 2017, 55% in 2018
We have a training program for cyber attacks

We have paid a ransom

We have a plan for post-discovery steps

We have cyber insurance
Do you have a plan to resume mission critical operations in case of a crisis?

- **Yes**: 82%
  - 2014: 75%
  - 2015: 81%
  - 2016: 81%
  - 2017: 81%
  - 2018: 82%

- **No**: 5%
  - 2014: 6%
  - 2015: 6%
  - 2016: 6%
  - 2017: 4%
  - 2018: 5%

- **Not yet but in process**: 12%
  - 2014: 12%
  - 2015: 14%
  - 2016: 21%
Do you have a fully redundant data center, where you could get all your systems up and running in less than a week?

- **Yes, fully:**
  - 2014: 24%
  - 2015: 27%
  - 2016: 24%
  - 2017: 25%
  - 2018: 27%

- **Yes, partially:**
  - 2014: 33%
  - 2015: 43%
  - 2016: 41%
  - 2017: 43%
  - 2018: 48%

- **Planning stage:**
  - 2014: 7%
  - 2015: 10%
  - 2016: 8%
  - 2017: 12%
  - 2018: 14%

- **No:**
  - 2014: 18%
  - 2015: 22%
  - 2016: 25%
  - 2017: 23%
  - 2018: 28%
How has the percentage of IT spend on security changed over the past five years?

- **Increased**:
  - 2014: 71%
  - 2015: 76%
  - 2016: 77%
  - 2017: 71%
  - 2018: 78%

- **Stayed the same**:
  - 2014: 26%
  - 2015: 19%
  - 2016: 19%
  - 2017: 18%
  - 2018: 24%

- **Decreased**:
  - 2014: 2%
  - 2015: 5%
  - 2016: 3%
  - 2017: 3%
  - 2018: 3%

- **Don't know**:
  - 2014: 1%
  - 2015: 1%
  - 2016: 2%
  - 2017: 1%
  - 2018: 1%
Is the plan to resume mission critical operations:

- **Tested less frequently than annually**
  - 2014: 34%
  - 2015: 27%
  - 2016: 25%
  - 2017: 26%
  - 2018: 26%

- **Tested more frequently than annually**
  - 2014: 7%
  - 2015: 13%
  - 2016: 10%
  - 2017: 7%
  - 2018: 7%

- **Never been tested**
  - 2014: 36%
  - 2015: 35%
  - 2016: 32%
  - 2017: 29%
  - 2018: 35%

- **Tested annually**
  - 2014: 31%
  - 2015: 30%
  - 2016: 30%
  - 2017: 30%
  - 2018: 31%
Do you deploy video surveillance on your campus?

- **Yes**: 94% (2018) vs. 91% (2017)
- **No**: 6% (2018) vs. 7% (2017)
- **We are planning on deploying in the next year**: 1% (2018) vs. 2% (2017)
Has your institution implemented a multifactor authentication solution?

- Yes: 46% (2018)
Fully Automated – You’re Being Watched by a Computer, Right Now

*ProctorCam (Pearson)*
*ProctorTrack (Verificent)*

Record and Review – You Might Be Watched by a Real Person, Someday

*Remote Proctor Now (SoftwareSecure)*

Fully Live – You’re Being Watched by a Real Person, Right Now

*Examity*
*ProctorU*
“I think within the next two years [security] will get off the top five list [of concerns] … it’s probably two years until all the issues around easy quarantine, and everybody being educated and having all the really great auditing tools out there. …”
Changing the Network Access Paradigm

Where We Need to Be

- Who Are You?
- What Are Your Qualifications?
  - Patches Up-to-Date?
  - Antivirus Up-to-Date?
  - No Malware?

Where We Are Today

Come On In – Everyone Is Welcome!

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Seven Guiding Principles of IT Security

- **Defense in Depth**
  - Combine proactive & reactive mechanisms

- **Principle of Least Privilege**
  - Users, processes, & resources get minimum necessary access

- **The Weakest Link**
  - Establish and enforce sound policies and train all users

- **Security Expertise is Key**
  - Establish a CISO office; mix central policy w. distributed implementation

- **Build Security in Early**
  - The earlier a defect is found, the cheaper it is to fix

- **Be Paranoid**
  - Don’t just build for legitimate or “correct” usage

- **Simplify, Simplify, Simplify**
  - Simpler systems are easier to deploy, manage, & maintain
Predicaments that on-the-run clients get into…

How would you rank:

- Files, passwords, cookies left on unsecured systems
- Files exposed through service repair/exchange
- Theft of device
- Copying data when no one is looking
- Breaking into your VPN session
- WLAN intrusions
- Breaking into your shared network folders
- Theft of ID
- Wiretaps on your broadband, phone etc
- Backdoor programs invading your device
Why Bother With E-Identity in HE?

Identity is a strategic asset!

Identity is about accountability
Three Professional Relationships

- Peer relationships
- Being mentored
- Being a mentor
• Be overly optimistic
• Don't object when a project request does not come with analysis of needs
• Please users by offering early dates
• Accept a project with poorly defined user requirements
• Fail to accurately assess long-run project priority
• Underestimate project requirements
• Attempt to estimate beyond a reasonable time
• Fail to recognize political implications
• Fail to have “back door” in place
Additional Thoughts

- Develop clear goals
- Senior Sponsorship is crucial
- Must secure multi-year funding
- It is a program, not a project
- What are we automating?
- Will the ERP package automate the target environment?
- What is non-automate-able and is that acceptable?
- How will the selection proceed?
- Improperly conceived change management strategies can lead to disaster
- ESPs are a requirement, but the PM must be organic
- Favor integration over best-of-breed
- Develop a standard application portfolio
- Focus on process consistencies
- Standardize the data layer and Minimize instances
- Customize for value, not legacy processes (do not automate old processes)
- References, references, references
What is the one message you’d liked the leadership to understand when it comes your job and/or information-technology needs of the institution?

- Executive Leadership must understand the value of IT: 36%
- Strategic planning must include IT: 29%
- Budget needs to reflect institutional needs: 28%
- Complexity is increasing: 10%
- IT staffing is critical to the institution: 7%
- Change management is essential: 7%
- Executive Leadership must listen to IT leadership: 6%
- Innovation is essential: 6%
- Business process needs to change to include IT: 6%
- Security issues are critical for the institution: 4%
- IT governance is essential: 3%
What Technology Can and Can’t Provide…

Great communication tools

But not hugs

Lots of data, information and knowledge

Not necessarily wisdom and understanding

The beginning of wisdom is:

Get wisdom; yea, with all thy getting get understanding.

Proverbs 4:7