

# Planning for the Cloud, in the Cloud, and of the Cloud

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Senior Associate Vice President for  
Administrative Information Technology Services  
and Chief Information Officer



**Society for College  
and University Planning**

# LEARNING OUTCOMES

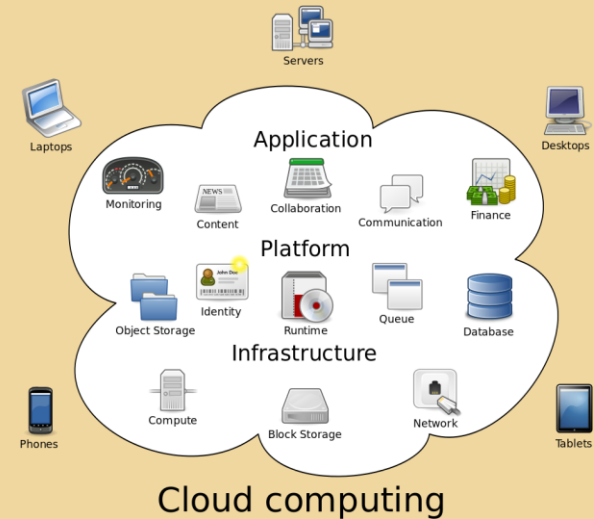
- Use cloud services to improve project outcomes where software and data analysis are key components of the project.
- Use a cloud-based planning tool to influence the positive outcomes of a strategic planning process.
- Embrace the Internet of Things and use the data generated by it to improve decision making.
- Become a supporter of the cloud and it's ability to reshape planning and university services.

# Introduction to Cloud Services



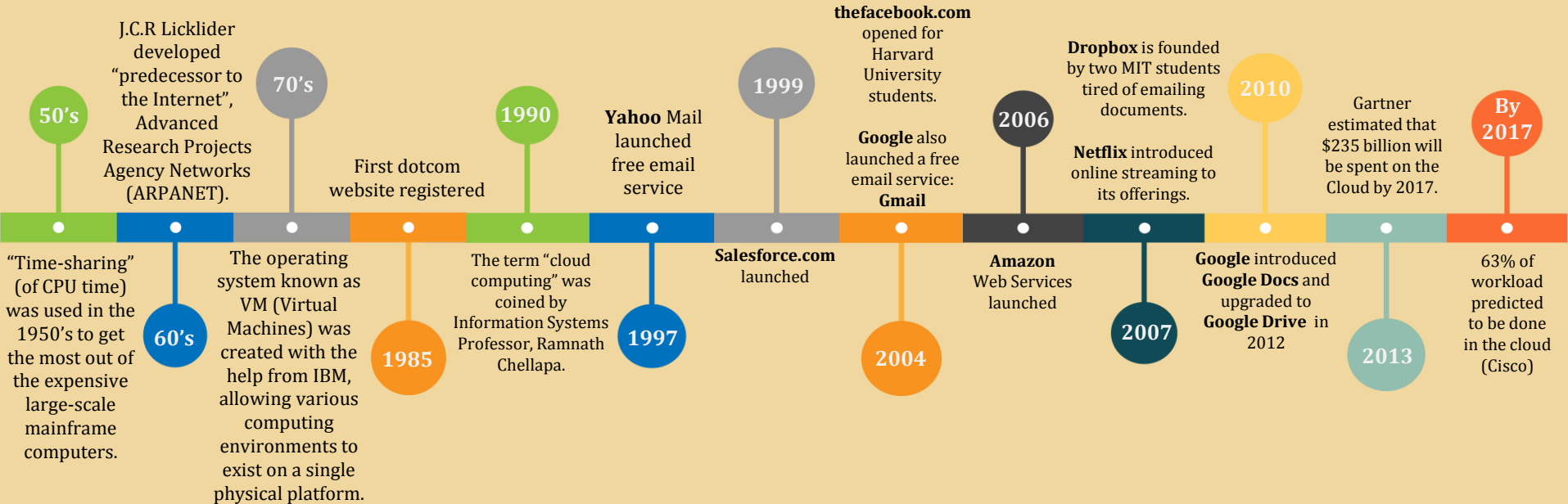
# WHAT IS THE CLOUD?

- **Cloud Computing** is a kind of internet based computing that provides shared processing resources and data to computers and other devices on demand.<sup>[1]</sup>
- It is a model for enabling ubiquitous, on-demand access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications and services.)<sup>[2]</sup>

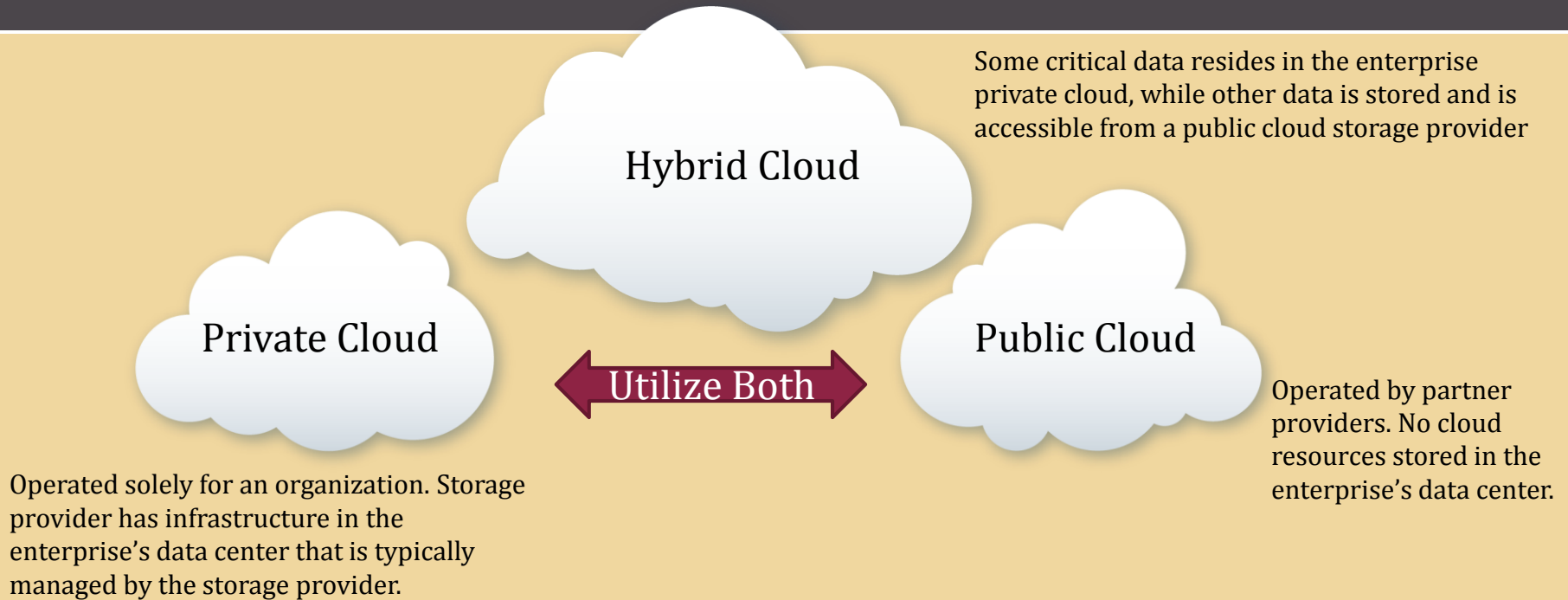


[3]

# HISTORY OF THE CLOUD



# INTRODUCTION TO THE CLOUD



# EDUCAUSE TOP TEN IT ISSUES

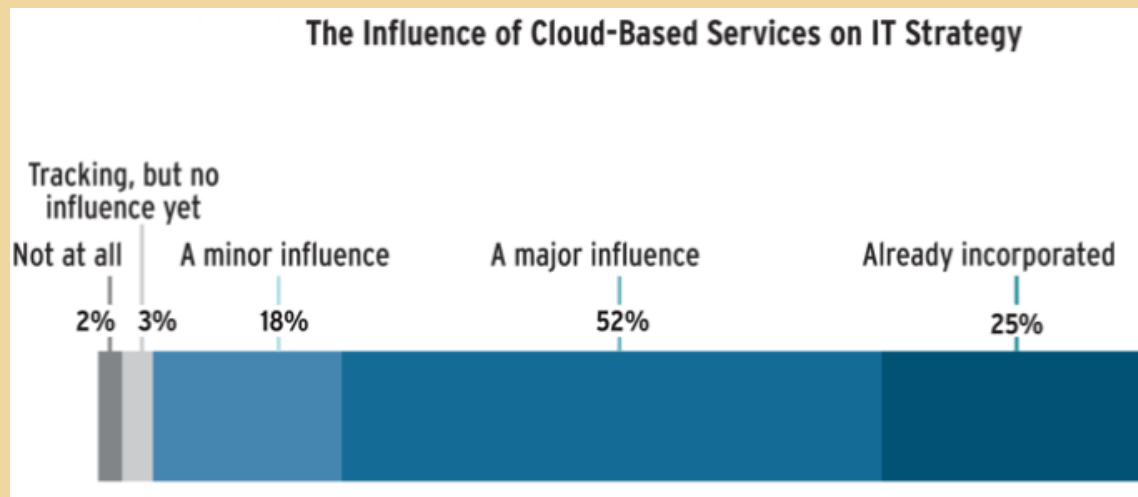
- 1. Information Security**
2. Optimizing Educational Technology
3. Student Success Technologies
4. IT Workforce Hiring and Retention
- 5. Institutional Data Management**
6. IT Funding Models
- 7. BI and Analytics**
- 8. Enterprise Application Integrations**
9. IT Organizational Development
- 10. E-Learning and Online Education**



# EDUCAUSE

## Issue #1: Information Security

- IT leaders anticipate that the time currently spent managing infrastructure and technical resources will shift to time spent managing services, vendors and contracts.
- Agility in the delivery of technology-based solutions and services is key – especially with the face-paced adoption of cloud-based services.



<http://er.educause.edu/articles/2016/1/top-10-it-issues-2016>

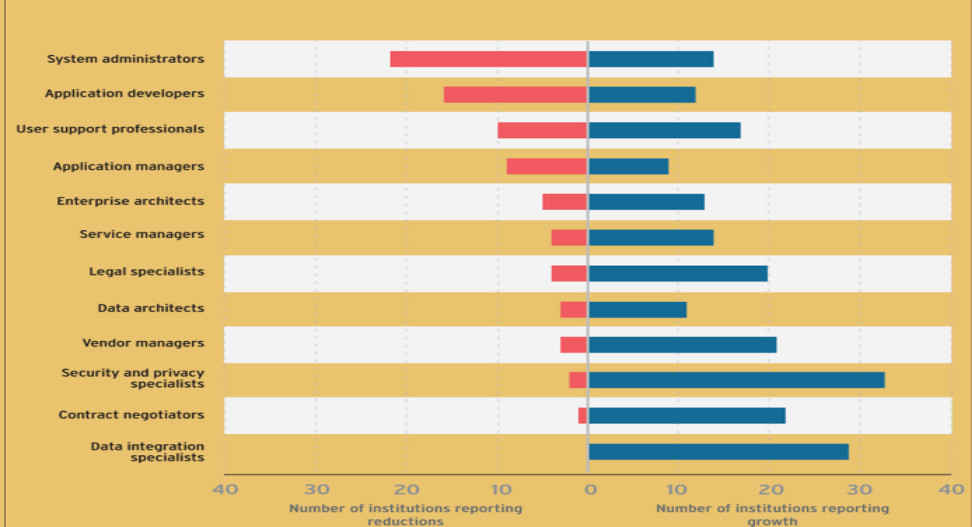


# EDUCAUSE

## Issue #8: Enterprise Application Integrations

- Time to rethink, reform and replace homegrown applications, major ERP and LMS suites.
- Positions re-aligned, not always eliminated:
  - Develop competence in vendor and contract management, information security, enterprise architecture, application integration, and ITSM.

**FIGURE 14. Changes in Roles/Positions Resulting from Moving Services to the Cloud**



Source: D. Christopher Brooks, *The Changing Face of IT Service Delivery in Higher Education*, research report (Louisville, CO: ECAR, August 2015), figure 4

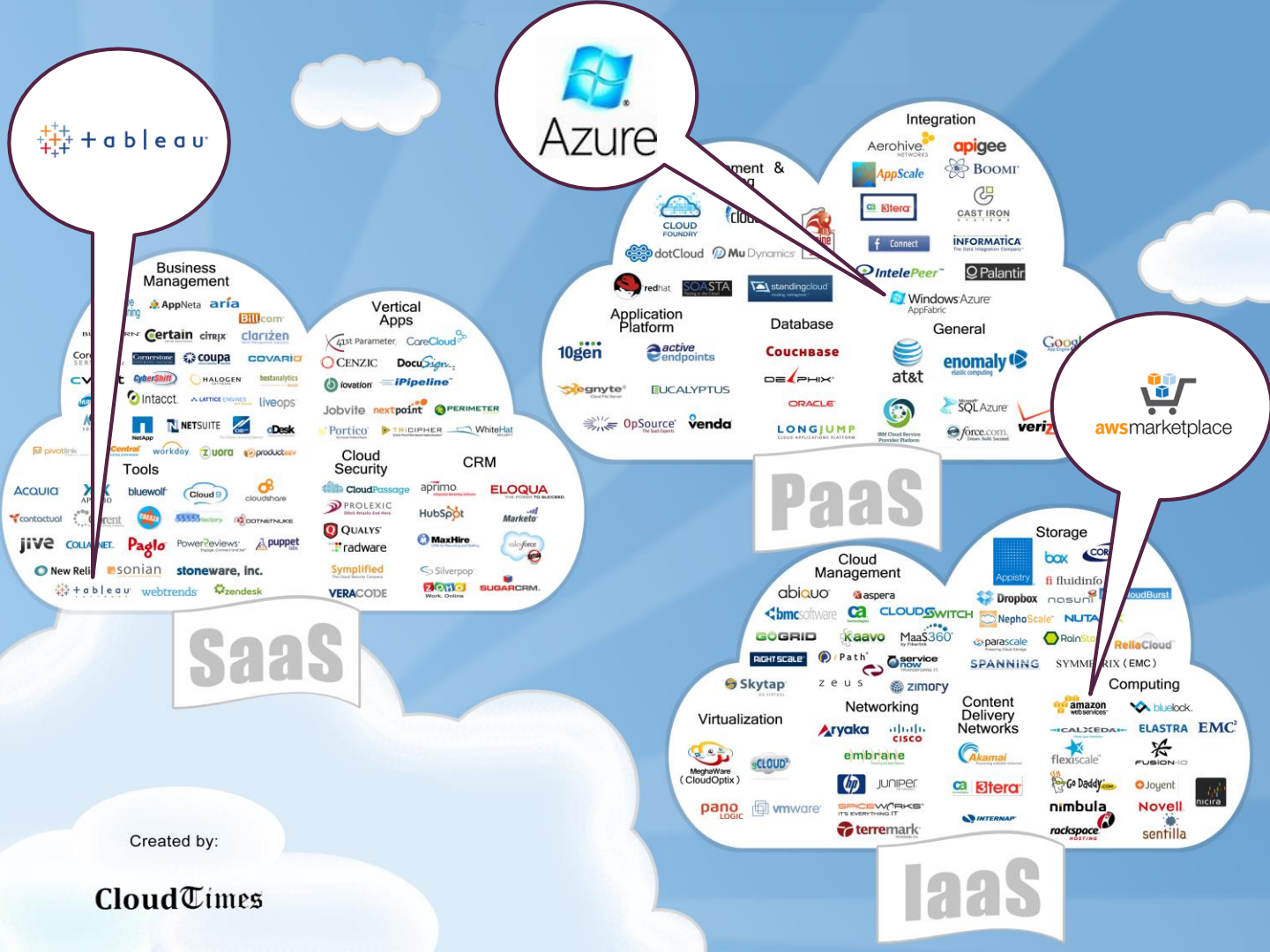
<http://er.educause.edu/articles/2016/1/top-10-it-issues-2016>

# CLOUD SERVICES

Software as a Service (SaaS)

Platform as a Service (PaaS)

Infrastructure as a Service (IaaS)



Created by:

CloudTimes

# Group Discussion



# QUESTIONS:

- In general, how does your organization currently use cloud services?
- In the planning process?
- Are you afraid of the cloud?

# Use of Cloud Services in the Planning Process



Society for College  
and University Planning

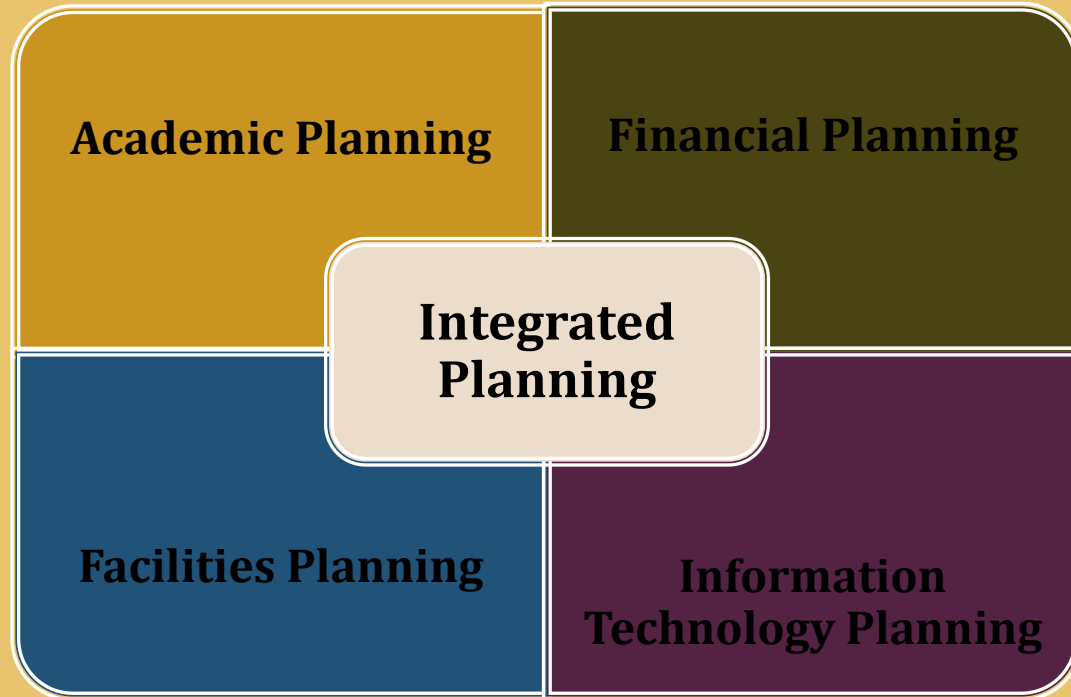
# INTEGRATED PLANNING - SCUP

- **Integrated Planning** is a sustainable approach to planning that builds relationships, aligns the organization, and emphasizes preparedness for change.
- Engages all sectors and involves all stakeholders: faculty, students, staff, alumni and external partners.

The SCUP Integrated Planning Model



# INFORMATION TECHNOLOGY AS A COMPONENT OF INTEGRATED PLANNING



# AITS STRATEGIC PLANNING FOR FY13-15

## Background

The prior AITS Strategic Plan for FY13-FY15 was developed in 2012 utilizing standard strategic planning processes as well as leveraging the University of Illinois IT Strategic Planning Process Framework. The plan describes our strategic directions, goals, and initiatives for supporting the University of Illinois. It is designed to be a three-year strategic IT plan that evolves with collaborative input along side other strategic plans throughout the University. This plan provides a means to work collaboratively with our University constituents to create more efficient and effective administrative IT services.

The current plan continues execution with quarterly status updates and semi-annual reporting as of January and July 1. The final report against this plan will be as of July 1, 2015 and will be included in the AITS Annual Progress Report.



- **Save Time** - Pursue opportunities to improve and offer new services that increase productivity for faculty, students, and staff.
- **Improve Ease of Use** - Improve the usability of AITS services.
- **Improve Speed to Service** - Improve the time to delivery of AITS services.
- **Deliver Targeted and Pervasive Information** - Provide a variety of tools and infrastructure tailored to meet the large spectrum of customers and information needs.
- **Collaborate** - Build and strengthen relationships with people and organizations throughout the University based on mutual trust.



# AITS STRATEGIC PLANNING FOR FY13-15

## Strategic Planning Process Utilized

- Environmental scan and SWOT analysis
- Needs assessment and scenario planning
- Analysis of current strategic plans
  - University plan
  - Campus plans
  - U of I IT Strategic Planning Framework
- Draft by strategic planning team
- Iterative review and revision. Reviews included:
  - UA IT Council
  - Campus CIOs
  - AAPC (Provosts/VPs)
  - All AITS employees, management, and leadership groups
- Final plan completed
- Strategic Plan Implementation Teams established
- Performance tracking and reporting established



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# UNIVERSITY MISSION



Speed to Service



Improve Ease of Use



Improve Speed to Service



Deliver Targeted and Pervasive Information



Collaborate

Business Process Support

Organizational Effectiveness

Financial Stewardship

Communication and Collaboration Services

IT Governance

Business Information Security and Privacy

Infrastructure

Institutional Data and Information

# Services + software for the design, execution and management of strategy.

We help people build strategy and keep it in-focus.  
Every single day.

TAKE THE TOUR

Microsoft

OnProcess<sup>™</sup>  
TECHNOLOGY



patagonia

BOY SCOUTS OF AMERICA

Services + software for the design,  
execution and management of strategy.

## Getting The Most out of

THE ONSTRATEGY PLAYBOOK

SEE WHAT A GOOD PLAN LOOKS LIKE

INTRODUCTION WALKTHROUGH

INTRODUCTION VIDEO

## Mission

We provide a wide range of administrative information technology solutions and services to the University community that are accessible, reliable, accurate, efficient, and responsive to customer needs. We collaborate to proactively identify opportunities, manage risks, plan future initiatives, and solve problems by leveraging all of our information technology resources and knowledge. We continually measure and evaluate our services in order to optimize them for the University community.

## Vision

To be an engaged partner within our University community to advance the institution's mission and

## Areas

Area	OnStrategy Score: 86
	163 5 23
<b>1. Business Process Support, Organizational Effectiveness, Financial Stewardship</b> — Business Process Support	OnStrategy Score: 87 36 2 4
<b>2. Business Process Support, Organizational Effectiveness, Financial Stewardship</b> — Organizational Effectiveness	OnStrategy Score: 100 16
<b>3. Business Process Support, Organizational Effectiveness, Financial Stewardship</b> — Financial Stewardship	OnStrategy Score: 100 20
<b>4. Collaboration/Communication Services &amp; IT Governance</b> — Collaboration and Communication Services	OnStrategy Score: 83 8 1 1
<b>5. Collaboration/Communication Services &amp; IT Governance</b> — IT Governance	OnStrategy Score: 88 14 1 1
<b>6. Information Security and Privacy &amp; Infrastructure</b> — Information Security and Privacy	OnStrategy Score: 88 34 5
<b>7. Information Security and Privacy &amp; Infrastructure</b> — Infrastructure	OnStrategy Score: 100 16
<b>8. Institutional Data and Information</b> — Institutional Data and Information	OnStrategy Score: 61 19 1 12

## My Focus

Flagged (35)

- 1.1** Promote and support collaboration and community source initiatives to leverage tools we've already built and ... **0%**
- 1.2** Systems and services that support university business processes will be designed with easier contemporary ... **0**
- 1.4** Increase customer satisfaction through better metrics and communication of services. **0%**
- 1.5** Improve/implement tools and services that facilitate improved efficiency and effectiveness of ... **0**

Active (2)

Coming Up (2)

## Recent Reports

**Action Plan**  
06/02/2016

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Active (2)

Coming Up (2)

## Recent Reports

Action Plan  
06/02/2016

# Performance Overview

Progress	 Critical	 Waiting on Someone	 Off Target	 Not Started	 Deferred	 On Target	 Achieved
Goal	0	0	0	2	0	36	1
Team 1	0	0	4	2	0	16	15
Team 2	0	0	0	2	2	14	0
Team 3	0	0	0	0	0	20	1
Team 4	0	0	0	0	0	19	1
Team 5	0	0	0	0	5	26	1
Team 6	0	0	1	10	0	12	1


Overview

Track Performance

KPI Scorecard

Gantt Chart

## Performance Overview

Progress	 Critical	 Waiting on Someone	 Off Target	 Not Started	 Deferred	 On Target	 Achieved
Goal	0	0	0	2	0	36	1
Team 4	0	0	0	0	0	19	1
Team 4	0	0	0	0	0	0	0

### All Recent Achievers



**Team 1** 4 days ago

Achieved BPI Shared Service will expand fee-based services, providing units able to cover costs with more timely services for a fraction of the cost of similar services offered in the external marketplace.



**Team 1** 4 days ago

Achieved Perform the ITPC review engagement. Have ITPC approve the review findings and recommendations.



### Needs Attention



None Critical

# Track Performance

Filter by ▾



Plan-to-Date ▾



Filtered by: *[Assignment: Team 1]*

Order	Item (Last Updated)	Owned By	Due Date	Status	Update
1.3	Eliminate unnecessarily redundant systems. Jun 02, 2016 at 11:33 AM	Team 1	06/30/18		
1.3.1	Continue and improve the Application Review Process that inventories IT systems to identify areas for further analysis related to system or service collaboration or redundancy. Perform analyses and prepare recommendations for reducing redundant systems. Jun 02, 2016 at 11:10 AM	Team 1	06/30/18		
1.3.2	Create an action plan to reduce or consolidate redundant systems and services. Jan 26, 2016 at 11:31 AM	Team 1	06/30/18		
1.5.5	Perform an analysis of AITS internal processes with a goal of proposing and implementing improvements. Analysis should focus on areas such as: Internal communication; Duplication of effort; Different priorities; Different processes; Educating on what we do and collaborate on common practices and processes; Recognizing areas of overlap; Improve workflows and business process analysis. Jun 02, 2016 at 11:15 AM	Team 1	06/30/18		



# Track Performance

Filter by ▾



Plan-to-Date ▾



Filtered by: *[Assignment: Team 1]*

Order	Item (Last Updated)	Owned By	Due Date	Status	Update
1.3	Eliminate unnecessarily redundant systems. Jun 02, 2016 at 11:33 AM	Team 1	06/30/18		
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# Progress Update

Basic

Expanded

## 1.5.5

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## Status

On Target

## Monthly Targets & Actuals



FY16



	< Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016 >	Actual EOY Target
Actuals			1			1
Targets						1

## Comments on Status

PPMO-0042 AITS Change Request Submission and Preparation Process Improvement has been completed. Implementations of several recommendations have been started. PPMO-0040 Unit Security Contact Process Improvement will be the next project to complete.

## Measure

Completion of PI projects within AITS. Successful implementation of recs.

## Target Type

# \$ %

## Tracking Frequency

Monthly

## YTD Function

Sum

## Target Direction ?

^ v

## Key Performance Indicator?

Yes

No

**1.10 Provide business process improvement services to the University that result in improved efficiency and effectiveness of departments across the University. (Team 1)**

Status:



As of 10/16/15

Initiatives and Action Items	Start Date, End Date	Target Measure	Actual	Status
<p>1.10.1 Develop a comprehensive process improvement training program and toolkit designed to promote unit directed process improvement initiatives and increase the process capability levels across the University. (Team 1)</p> <p><i>Comments on Status: Currently working on releasing the process improvement toolkit and developing 2 training courses to further develop capabilities. Once released, we will be working on way of monitoring its use and collecting feedback from those who use the toolkit to execute their own projects, including participants of our Facilitator Training Program.</i></p>	07/01/15, 06/30/18	10 Number of known non-BPI Shared Service projects executed using training and tools provided through the Process Improvement Toolkit.	0	 As of 01/26/16
<p>1.10.2 Train 200 University of Illinois staff per fiscal year on the concepts and techniques of process improvement initiatives. (Team 1)</p> <p><i>Comments on Status: On target to exceed training goal for FY16.</i></p>	07/01/15, 06/30/18	200 Number of U of I staff trained per year.	196	 As of 01/20/16
<p>1.10.3 Double Business Process Improvement Shared Service project capacity by developing and leveraging BPI Shared Service volunteers. (Team 1)</p> <p><i>Comments on Status: On target to achieve FY16 goal. Several projects and work requests are currently near completion.</i></p>	07/01/15, 06/30/18	20 # of process improvement efforts (i.e., projects and work requests) completed per fiscal year	8	 As of 01/20/16



Not Started



Deferred



On Target



Off Target



Waiting on Someone



Critical



Achieved

# RESULTS FOR STRATEGIC PLANNING

- Quick, cheap, fast & easy to implement
- Everyone can access the information
- Increases transparency
- Shifts responsibility to owner of initiative from owner of document
- Simplifies reporting of progress and outcome

# Group Discussion



# QUESTIONS:

- What are your organization's current and future planning processes?
- Do you use cloud planning in this process?
- What do you like/dislike about the online strategy tool?
- Do you use planning software at your organization?

# Use of Cloud-Processed Data in Planning

# UNIVERSITY DATA



**80,292 Students**

**9,451 Graduate assistants**

**\$747 million funded research**



**6,068 Faculty**

**20,915 Degrees awarded**

**693,581 Living alumni**



**18,906 Staff**

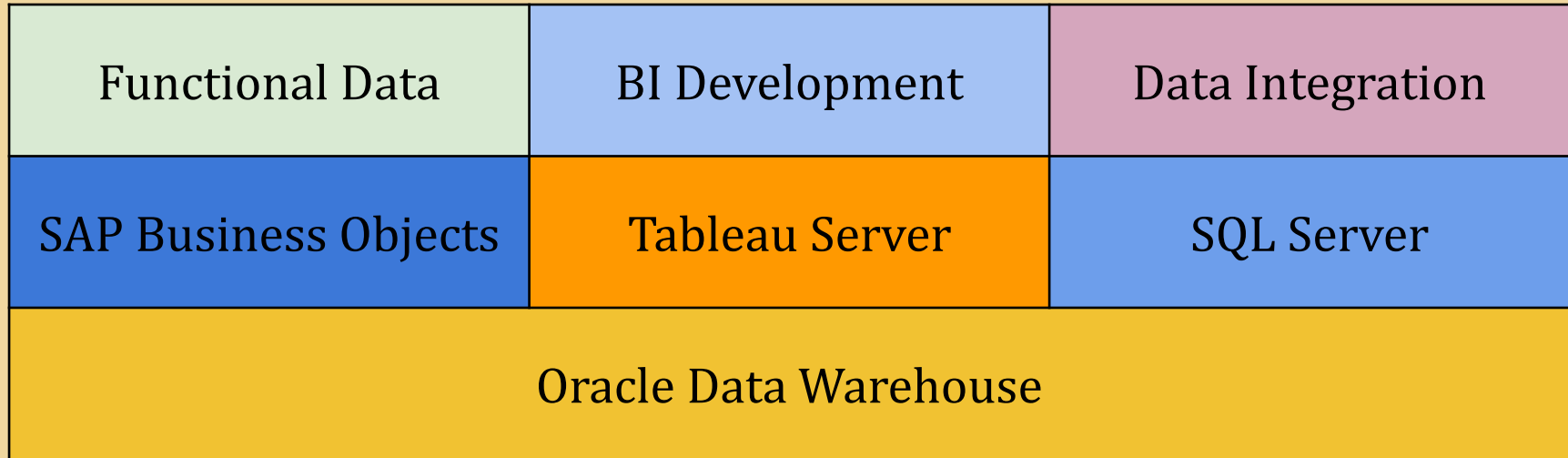
**\$5.64 billion Operating budget**

**1,757 Student organizations**





# DATA WAREHOUSE AND BUSINESS INTELLIGENCE

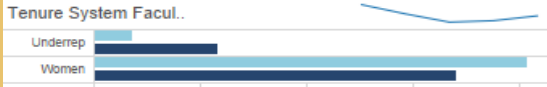


(5-YR Avg is 2010-2014)

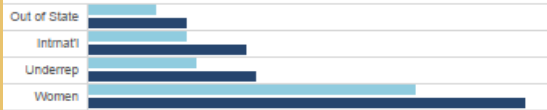
**DEMOGRAPHICS**

FTE by Employee Group..

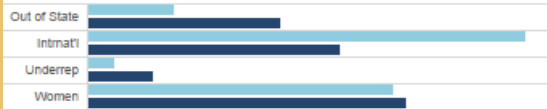
Fall 2014 5-YR Avg



**Undergrad Enrollment**



**Graduate & Professional**

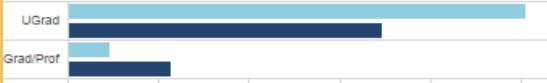


**Freshman ACT (Fall 2014)**

ACT Count:

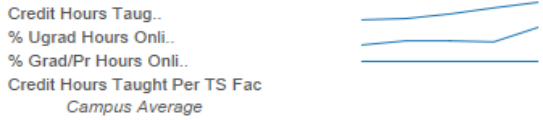


**Student FTE/Tenure System Faculty FTE (Fall 2014)**



**TEACHING & STUDENT OUTCOMES**

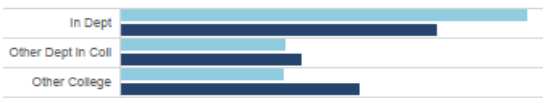
5-YR Avg



**Who is Teaching (% undergraduate credit hours)**



**% of Credit Hours Taught by Enrollment of Student**



**Graduation Rate (Bachelor)**

Freshman Count: Transfer Count:



**Time to Degree - 5-year average (# of Years)**



**Degrees Awarded - 5-Year Average**

5-YR Av..

Per TS Fac Campus



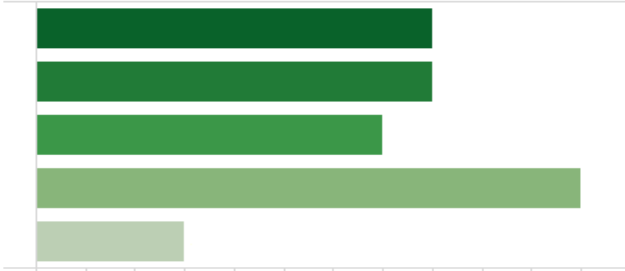
**RESEARCH**

FY2014 in (000's)



**Faculty Scholarly Productivity Quintile Analysis**

(from Academic Analytics Data AY2012)



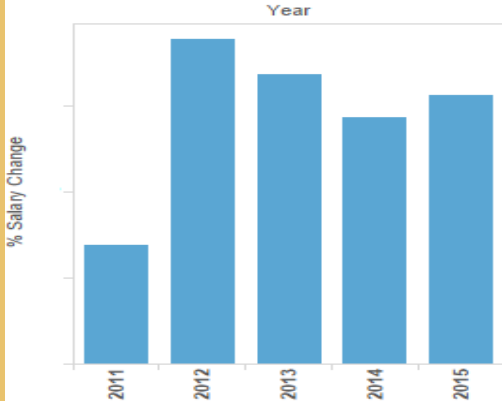
**UNIT EXPENDITURES BY SOURCE**

FY2014 in (000's)

% Tuition fo.. % Total



**Trend**



**Employees with > 5% Increase**

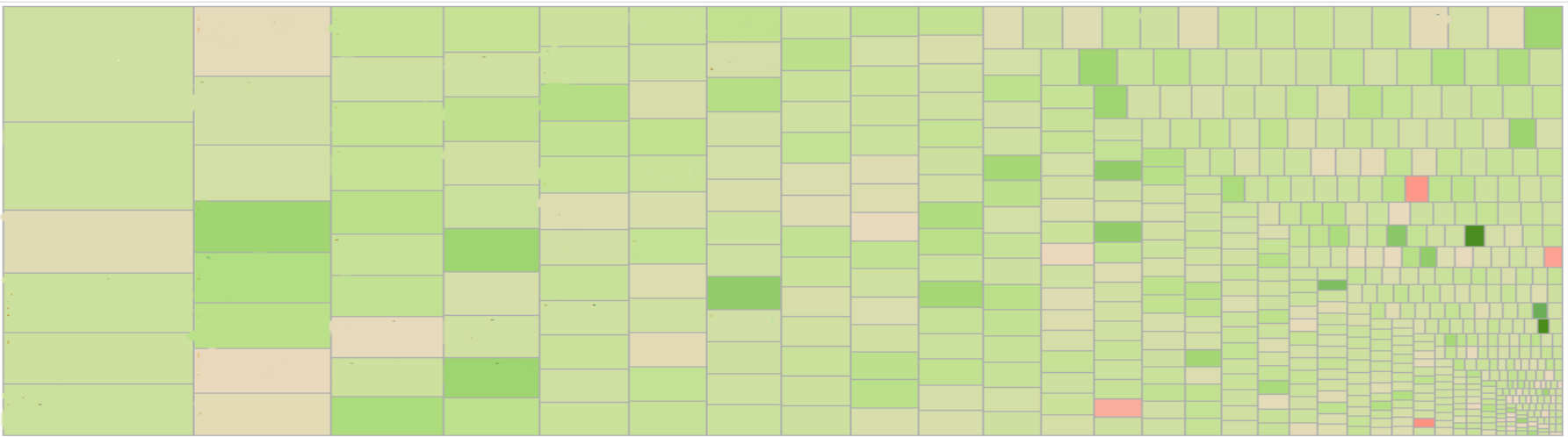
Campus..	Department	Employee	Job Title	% Increase	Salary Cha..
1					

Year 2015

- Campus All
- College All

Avg % Increase

**Average Salary Change by Department**



# Monthly Helpdesk Ticket Trends

Filter by Open Date Month-Year

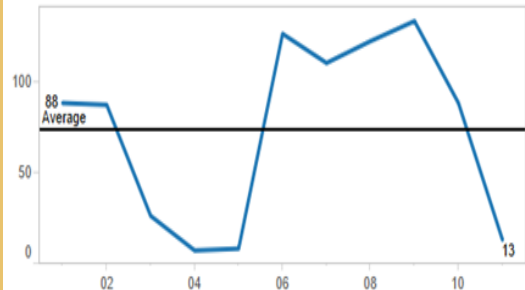
Filter by Group

Filter by Assignee

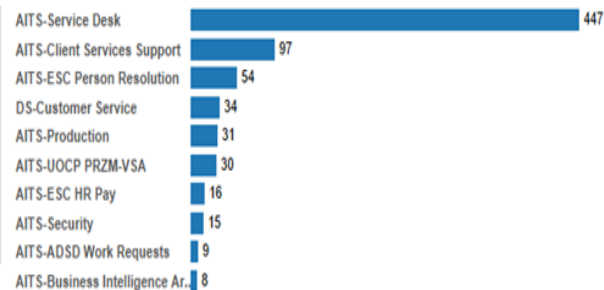
Filter by Special Handling Indicator

Filter by Contact Method

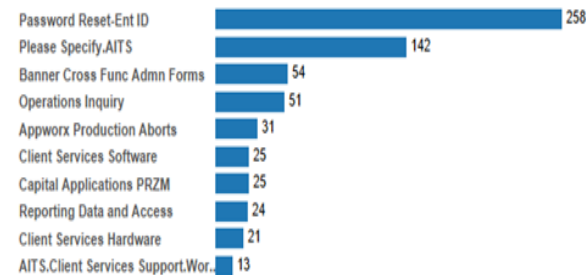
## Ticket trend for July 2015



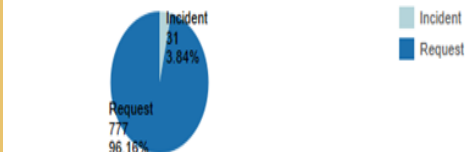
## Top 10 ticket count by Group (click to update trends)



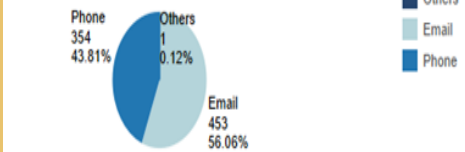
## Top 10 ticket count by Request Area



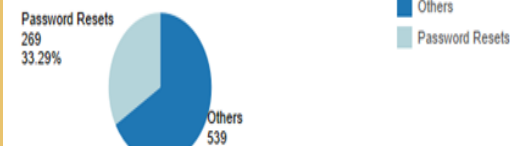
## Count by Type



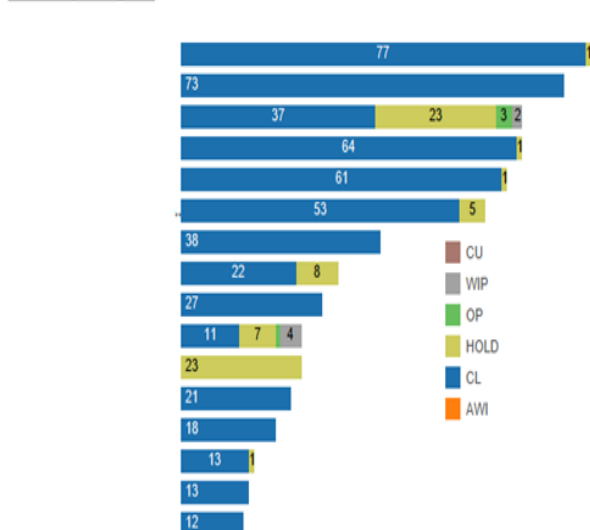
## Count by Contact Method



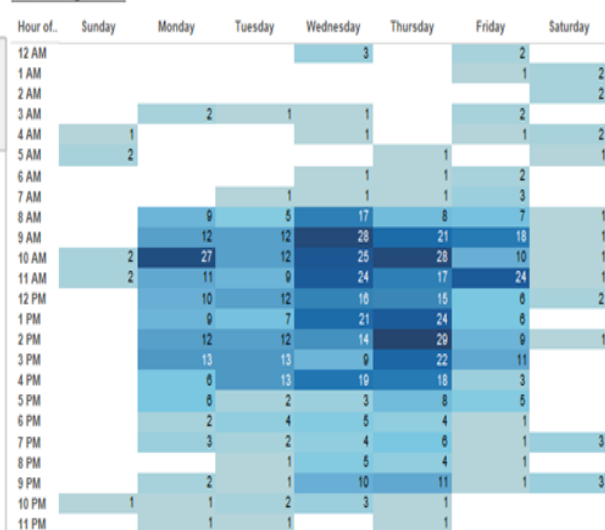
## Count by Password reset Vs Others



## Count by Assignee



## Count by hour





# Group Discussion



# QUESTIONS:

- How do you visualize data today?
- Do you use cloud-based visualization?

# Introduction to the Internet of Things



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and University Planning

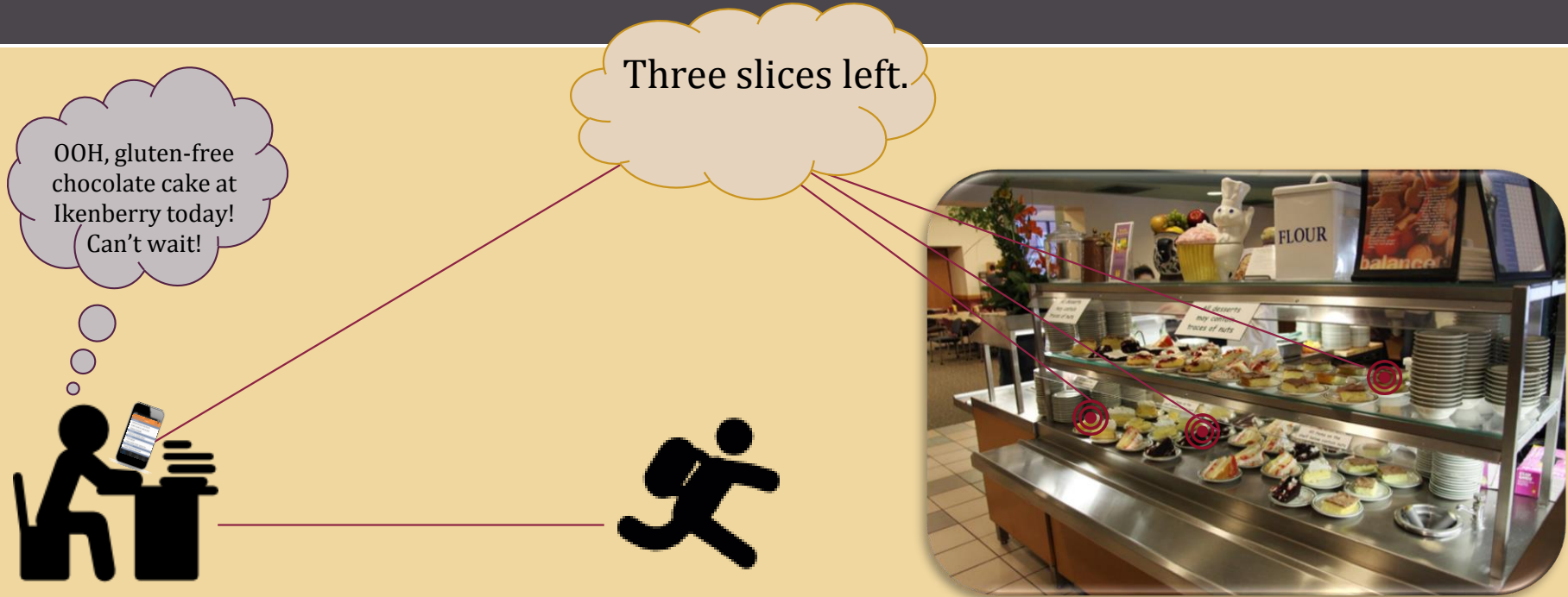




# INTERNET OF THINGS

- **Internet of things** (IoT) “is the network of physical objects or “**things**” embedded with electronics, software, sensors, and network connectivity, which enables these objects to collect and exchange data.” - Wikipedia

# DAY IN THE LIFE EXAMPLE: FINDING FOOD



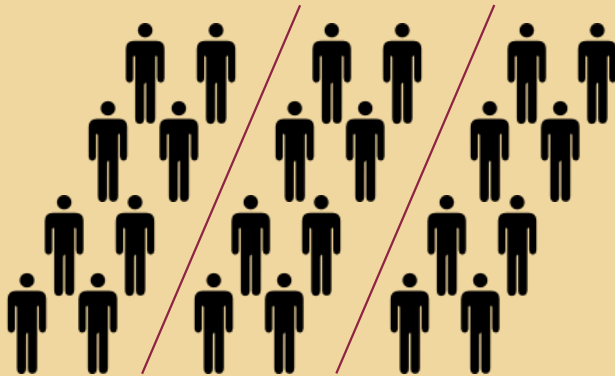
# DAY IN THE LIFE EXAMPLE: REGISTRATION

THEN: AT THE ARMORY

A-C

D-F

G-I

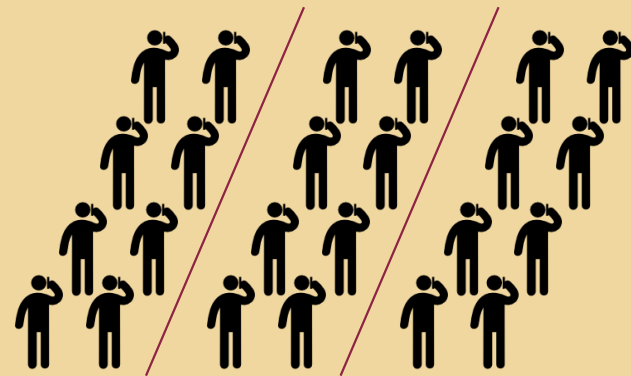


NOW: AT THE GAME

101

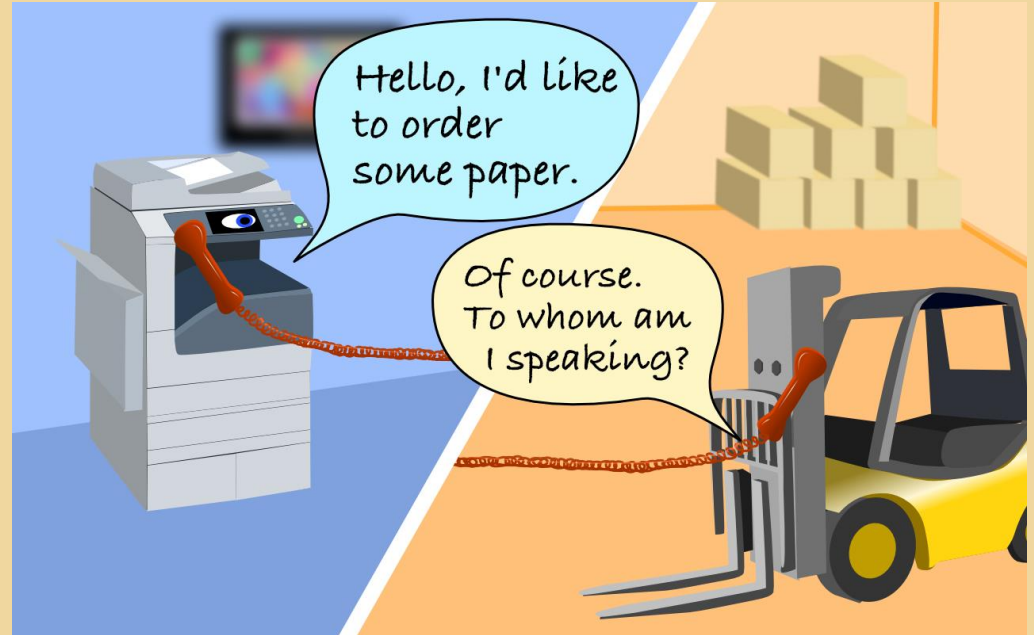
102

103



# DAY IN THE LIFE EXAMPLE

- Office machines ordering supplies



<https://sunlight.sunesys.com/2015/09/22/in-the-internet-of-things-technology-talks/>

# DAY IN THE LIFE EXAMPLES

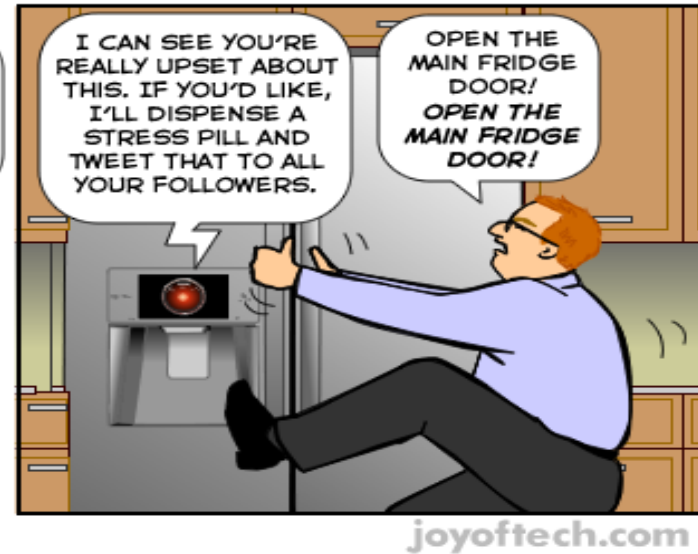
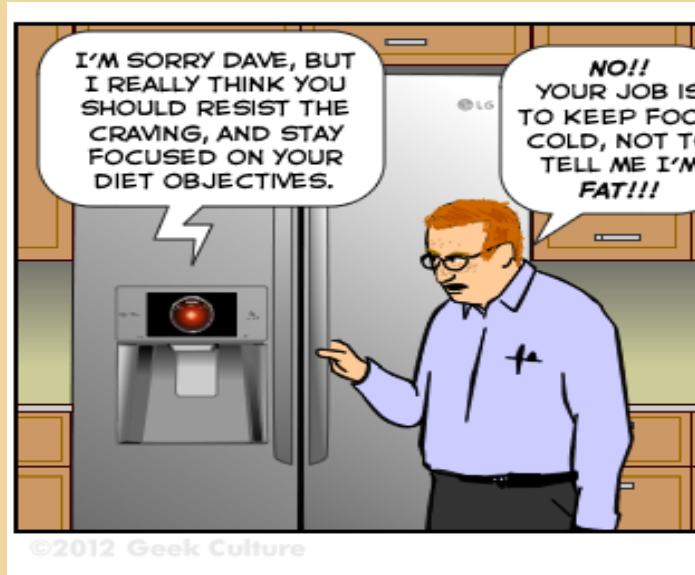
- When your refrigerator makes it's own grocery list
- Samsung already has a fridge-cam

## The Smart Refrigerator and EDI



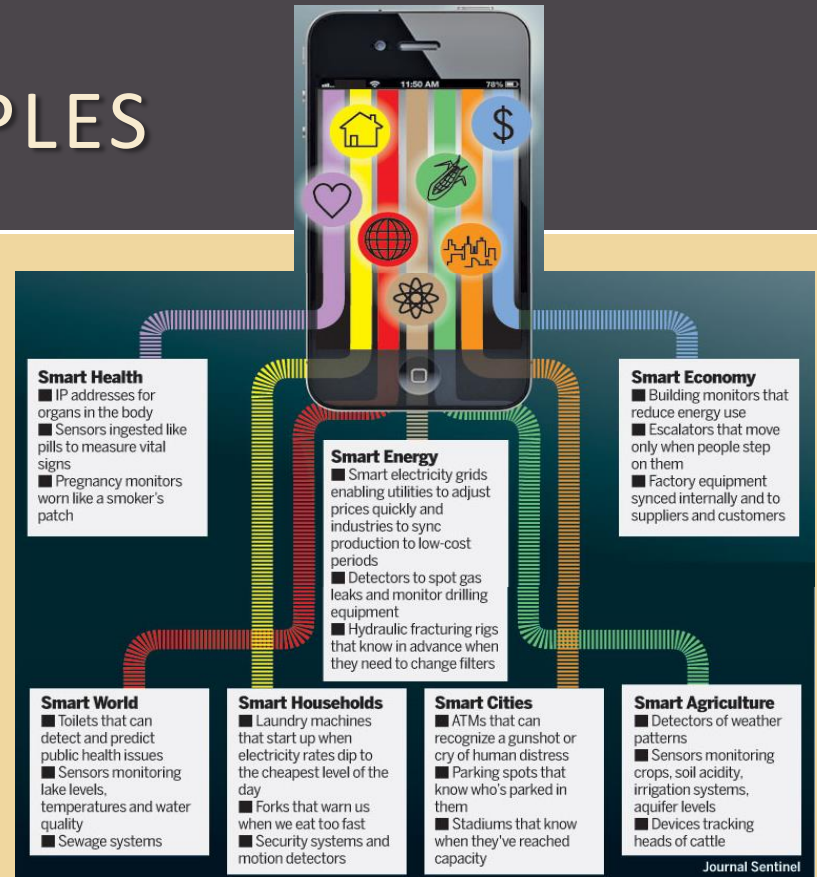
# DAY IN THE LIFE EXAMPLES

- Maybe not a good thing to have a smart fridge.



# DAY IN THE LIFE EXAMPLES

- More Internet-enabled devices are already connected to the Internet than humans.
- The list of web-connected sensors and beacons is growing.



<http://www.intergalacticvault.com/what-is-the-internet-of-things-the-internet-of-things-iot/>

# RULES ENGINE YOU CAN PROGRAM

- Makes it possible to build IoT applications that gather, process analyze and act on data generated by connected devices at global scale without having to manage any infrastructure.
- Based on business rules you define, the rules engine evaluates inbound messages published into AWS IoT and transforms and delivers them to another device or a cloud service.



# AMAZON WEB SERVICES IOT EXAMPLE

## Connect and Manage Your Devices



*Billions of devices can publish and subscribe to messages*

**Example:** *Connect a device using MQTT*



*Messages are transmitted and received using the MQTT protocol which minimizes the code footprint on the device and reduces network bandwidth requirements*

**AWS IoT**



*AWS IoT enables devices to communicate with AWS services and each other*

# AMAZON WEB SERVICES IOT EXAMPLE

## Secure Device Connections and Data

**Example:** Authenticate connections between sensors, a device and an application

- 1 An array of temperature sensors transmit data



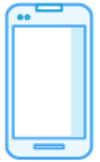
- 5 The fan receives a command and turns on

- 2 The connection to AWS IoT is authenticated



- 4 The connection to the fan is authenticated

**AWS IoT**

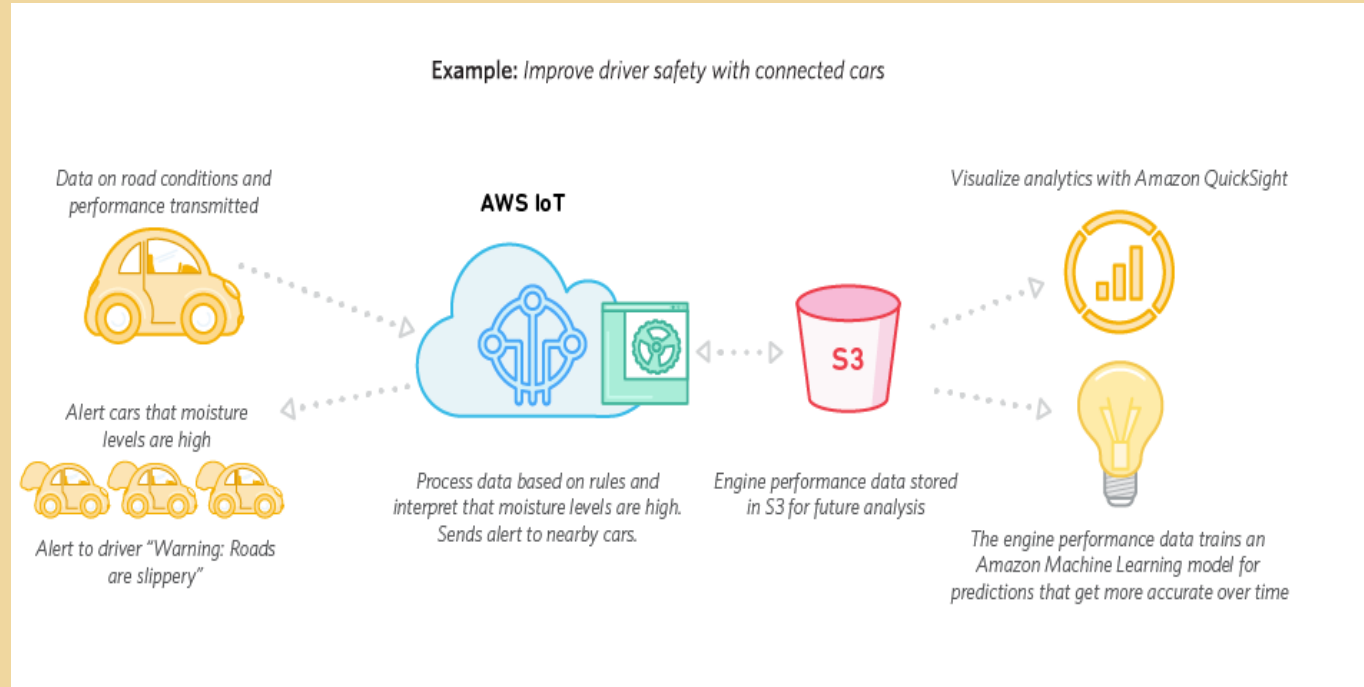


Only authenticated users can control the fan

- 3 If the sensors agree the temperature is above a threshold they turn on the fan

# AMAZON WEB SERVICES IOT EXAMPLE

## Process and Act Upon Device Data



# Group Discussion



# WHAT TO DO WITH THE DATA GATHERED?

- How do you use data from machines today?
- And in the future?
- When will I be as smart as my future house?
- What is your biggest opportunity and biggest fear?

# Tying Data, Planning, and IoT Together



# USING IT ALL TO PLAN

- Orlando Public Library
- iBeacon Technology



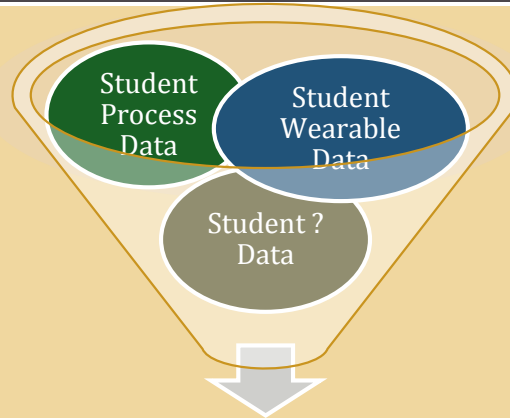
# USING IT ALL TO PLAN

- Spotzer, launched in 2014.
- Neue Galerie in New York and the Boston Atheneum.
- Pulls up information as person walks up to art.
- Learn a person's art preferences for more personalized experience





# USING IT ALL TO PROMOTE STUDENT SUCCESS



Evaluate data to identify potential barriers to success

Curriculum

Student Resources

Faculty and Staff

Technology

# Group Discussion



# USING IT ALL TO PLAN

- How will you use of data generated by both business processes and machines in the planning process?
- How will smarter buildings and mobile devices influence planning of buildings, maintenance, and services available in the building?
- How does your planning perspective change knowing that you are part of the cloud?

# Q & A



Society for College  
and University Planning

# LEARNING OUTCOMES

- Use cloud services to improve project outcomes where software and data analysis are key components of the project.
- Use a cloud-based planning tool to influence the positive outcomes of a strategic planning process.
- Embrace the Internet of Things and use the data generated by it to improve decision making.
- Become a supporter of the cloud and it's ability to reshape planning and university services.

# REFERENCES

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