As Technology
Changes Audit,
So Must the
Auditor Change

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37WCARS



## Agenda

- A Disruptive and Changing World
- Impact on Auditors
- Implications for the Future Workforce



## A Disrupted World

- Digital disruption is already here
  - World's biggest taxi service...has no taxis (Uber)
  - Popular 'banks'...don't have vaults (Venmo, M-Pesa)
  - Most popular 'hotel service'...doesn't own a hotel (AirBnB)
- Transitioning from 'value chain' business models to digital 'ecosystems'



### Business Models for the Digital Economy

Complete

Knowledge of end consumer

**Partial** 

#### **Omnichannel business**

- "Owns" customer relationship
- Multiproduct, multichannel customer experience to meet life events
- · Integrated value chain

Examples: banks, retailers

#### **Supplier**

- · Sells through another company
- Potential for loss of power
- Skills: low-cost producer, incremental innovation

Examples: insurance via agent, mutual fund via broker

#### Ecosystem driver

- · Provides a branded platform
- · Ensures great customer experience
- Plug-and-play third-party products
- · Customer knowledge from all data
- Matches customer needs with providers
- · Extracts "rents"

Example: Amazon

#### Modular producer

- Plug-and-play product/service
- · Able to adapt to any ecosystem
- Constant innovation of product/service

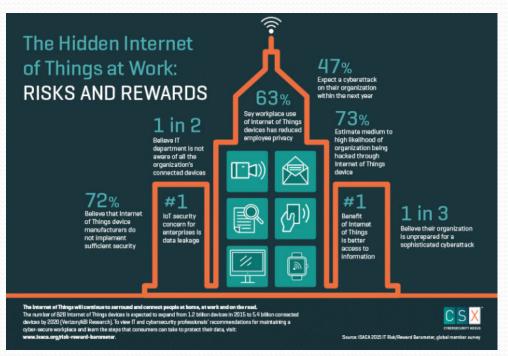
Example: PayPal

Value chain

Business design Ecosystem



## Towards 21,000,000,000+ Devices

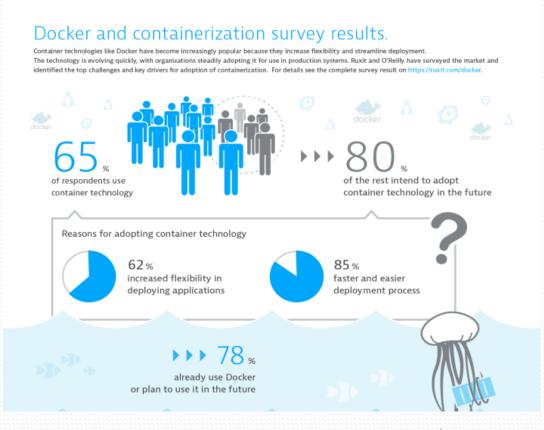


- Gartner predicts that by 2020,
   20.8 billion devices will be in use worldwide. This includes:
  - Connected vehicles
  - Industrial and consumer IoT
  - Mobile devices
  - Operational technology (e.g. biomedical and industrial control systems)



## Increasing Tech Complexity

- In addition to the number of devices, technology complexity is also increasing within the infrastructure
  - Containers
  - Virtualization
  - Externalization (cloud)
  - Software defined infrastructure





Source: Ruxit

## Impact on Auditors

## Impact on Practitioners

- Relative to business and technology peers, auditors need to do more to evaluate risk...and they have less time to do it in.
- Two reasons are driving these constraints:
  - Differential in risk vs. usage decision making
  - Adoption dynamics



### Differential in Risk vs. Usage Decision Making

#### Consider an automobile...

#### Answering "how do I use it?":

- Learn rules of the road
- Learn to drive
- Understand vehicle maintenance requirements
- Anything else?

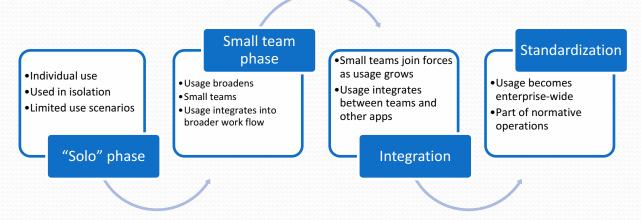
#### Answering "is it safe?":

- Learn rules of the road
- Learn to drive
- Weather/traffic conditions
- Seatbelts/safety features
- Steering and drive column condition
- Route/s to be traveled
- Tire condition
- Engine service history
- Road maintenance/condition





## **Adoption Dynamics**



- Ask yourself: when does the auditor learn about usage?
- In some cases, it may only be after usage is already prevalent:
  - Shadow IT
  - Audit cycle planning (typically annually)
  - "Discovery gap" for new applications and usage



## The Impact

"...shortened deployment lifecycle[s] will require more agile auditing techniques such as continuous auditing and audit automation... The profession must become technologically astute, not only to understand it [technology] but also the capability to use it in novel manners to support the audit function as well as the foresight to propose new technology advancements to support the profession."

—ISACA Future of IT Audit Report

#### Some "hard questions":

- Is your team "technically astute" enough to face what's coming?
- Are you staying on top of the newest advancements in technology?
- Are your auditing techniques agile, continuous, and automated?



## Top Technology Challenges: YoY Trends

2015	YOY Trend*	2014	2013
Emerging technology and infrastructure changes — transformation, innovation, disruption		IT security and privacy/ cybersecurity	IT security: data security, cybersecurity and mobile security
T security and privacy/ cybersecurity		Resource/staffing/skills challenges	IT governance
Resource/staffing/skills challenges		Emerging technology and infrastructure changes – transformation, innovation, disruption	Lack of successful ERP implementations, development and knowledge
nfrastructure management		Regulatory compliance	Social media
Cloud computing/virtualization	•	Budgets and controlling costs	Vendor management
Bridging IT and the business		IT governance and risk management	Cloud computing
Big data and analytics		Big data and analytics	Emerging technology and infrastructure changes
Project management and change management		Vendor, third-party and outsourcing risks	Big data and analytics
Regulatory compliance		Cloud computing/virtualization	PCI compliance
Budgets and controlling costs		Bridging IT and the business	NA



### The Road Ahead

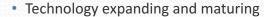


### Digital Solutions Bring Digital Concerns

- Increased systems complexity and risk
- Greater Board-level involvement in IT operations, strategy, etc.
- Faster cycles of innovation
- Robust ROI on technology investments expected
- Increased and more prominent roles for IT Risk, Audit, and Governance, as well as Cyber Security



## Holistic Perspective



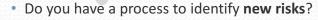
 New developments like IoT, mobile, cloud, change businesses and can benefit auditors

businesses and can benefit auditorsWhat's your plan to

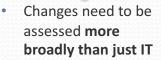
leverage them?

 Rapid change is the norm: organizations must evolve their policies, processes, people

 Agile and flexible is the order of the day



- To upgrade aging technology?
- To prevent security and privacy breakdowns?
- Having a plan means addressing these questions head on.





### **Best Practices: Actions**

- Keep business informed about emerging risk and perspectives in strategy
- Audit must always ask and answer:
   Are we making progress?
   Are we doing what we need to do to get where we want to go?
  - Answering means both an "elevator pitch" and systemic metrics
- Communicate with management and the audit committee regularly to emphasize the importance of conducting an IT risk assessment
- Consider linking your IT audit risk assessment with the ERM catalog to show the integration between the two
- Ensure that IT and cybersecurity risks are understood and monitored as strategic-level risks, when warranted, and as a matter for the board of directors and audit committee to monitor regularly



## Big Data, Analytics, and Visualization: Potential Impact to IT Audit

#### Organizational impact

If the organization is using big data to drive decision making, IT Audit should audit how big data is managed.

#### Data integrity

If the organization relies heavily on big data, IT Audit should audit data integrity.

#### IT audit execution

IT Audit can use big data to perform internal audits in new ways.

#### Visualization

New ways of looking at data can open up opportunities for auditors

## Big Data, Analytics, and Visualization: Action Items

- "Checking the box" is not Data Analytics
  - The organization must have a strategy to manage the data life cycle – creation, integrity, normalization, destruction, etc.
- It's a process, not a project
  - Don't stop expanding the scope of data analytics. Start small and build.
- Visualization = opportunity
  - Investigate free or low-cost data visualization tools to find value, prove worth.



### Cloud and Shadow IT: Key Cloud Risks

#### OPERATING IN A CLOUD ENVIRONMENT PRESENTS RISKS IN SIX KEY DIMENSIONS

- Do I know where my data is located in the cloud?
- Has data been classified as per company policies and secured accordingly?
- · Is my customer data appropriately isolated, segregated and encrypted?
- What accounts do I have in the Cloud and is access to confidential data logged and monitored?
- How do I account for spending in the cloud and by who?
- What is my financial exposure?
- · How do I predict and project spending?

- How stable is the provider?
- Do I have processes in place to periodically reevaluate contract and SLA's established?
- Do I have a defined exit strategy?



- Am I aware of the compliance requirements to be met?
- Does the vendor have the required certifications?
- Does the vendor communicate and update the customer regarding continued compliance efforts?
- Have I considered the multiple configurations points?
- Are my production and development environment appropriately segregated across VPC's?
- Do I have a process to monitor for evolving technology?

- · Are there Load Balancers in place?
- · Is my Cloud application backed up appropriately?
- · Is there DR in place?
- Do I have a process to monitor SLA compliance?



#### Cloud and Shadow IT: Main Concerns

- Shadow IT
- Cloud Service Provider Operations
- Poor Due Diligence and Decision Making
- Poor Vendor Management
- Multiple Jurisdictions = Multiple Regulations
- Poor Governance over Cloud
- Legacy Applications are not Cloud Ready
- ROI Erodes by Unexpected Expenses



## Auditing Cyber Security: Why Cyber Security Matters to Audit

- Security has become a board and executive level issue.
- Must ensure the enterprise's cyber security program is defensible in court.
- IT and IT Security have technical experience, but audit understands that all risk is business risk.
- There is a lot of information on cybersecurity. But there is not an equivalent amount of information on how audit should address efforts to deal with cyber security risk.
- Within the next few years, external auditing firms may count cybersecurity controls as "in scope" as part of financial audits.
- The problem is not a lack of expertise; it is a lack of dialogue.



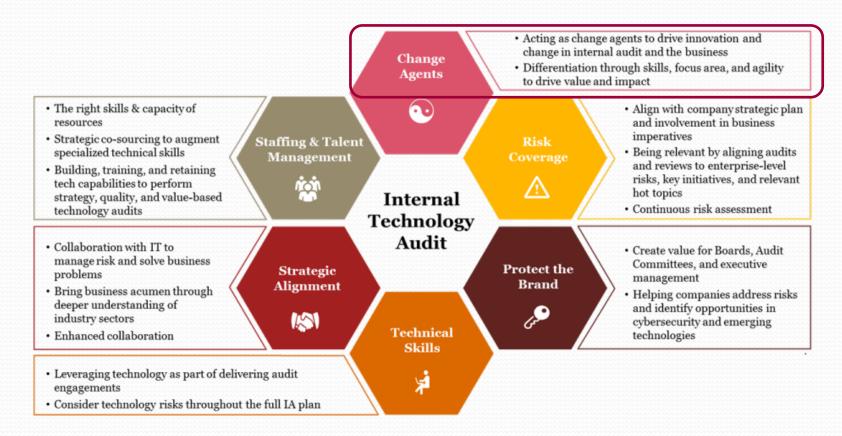
### **Auditing Cyber Security: Action Items**

- Ensure cyber security risk is integrated formally into the audit plan.
- Leverage applicable national cyber security frameworks (such as NIST in the U.S.) to increase defensibility and efficiency.
- Identify and act on opportunities to improve the organization's ability to identify, assess, and mitigate cyber security risk to acceptable levels.
- Recognize that cyber security risk is not only external; assess and mitigate potential threats that could result from the actions of an employee or business partner.



# Implications for the Future Workforce

## Talent Acquisition and Retention: Internal Audit Increasing Expectations





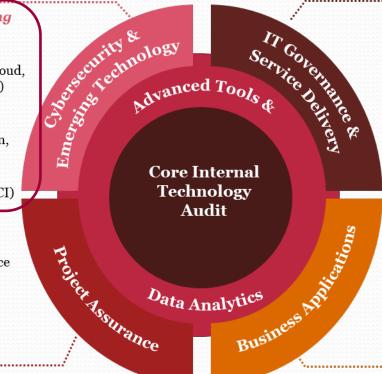
## Talent Acquisition and Retention: Internal Audit Increasing Expectations

#### Cybersecurity & Emerging Technology

- · Cybersecurity
- Emerging Technologies (cloud, mobility, social media, etc.)
- Threat & Vulnerability Management (e.g. A&P)
- Network, Operating System, And Database Security
- Technology Regulatory Compliance (ISO, NIST, PCI)

#### Project Assurance

- · Real-time Project Assurance
- Portfolio Optimization
- Program and Project Management
- · Benefits Realization
- Controls Outcome



#### IT Governance & Service Delivery

- · IT Governance & Strategy
- · IT Asset Management
- Data Governance
- · Global IT Operations
- Systems Development & IT Change Management
- · Business Resiliency
- · Third Party Risk Management

#### **Business Applications**

- Business Process Controls
- User Access & Segregation of Duties
- System interfaces and data quality
- ERP Optimization
- Automated Controls & Configurations



## Talent Acquisition and Retention: Modern-Day Challenges in Recruiting

- Rise of the contingent workforce, growth of freelance economy
   As more people seek flexible work opportunities, they are turning to part-time positions and freelance work.
- Technological advancements
   People want to work, access and share information the way they live—constantly connected with anybody, anytime, and anywhere.
- Multi-generational workforce
   Four generations comprise today's workforce; each one brings unique perspectives, attitudes and communication and working styles.



## Talent Acquisition and Retention: Action Items

- Use the most modern techniques.
   If an organization is using outdated techniques, and not becoming automated, it will lose millennials and digital natives quickly.
- Build an experience that matches the type of talent you are trying to attract.
- Speak their language.
- Sell what the business has rather than only the job itself.
- Give them more than just "grunt work"; focus on what motivates them.
- Give them experiences outside of the office.
- Give unexpected, surprise recognition
- Offer flexible work arrangements



### Future of Work

- The coming "new normal":
  - "On-demand" economy as chief driver of global economy
  - "Mobile-first" workforces utilizing SMAC technologies to maximize their organizations' efforts as digital leaders will be standard, across all industries, at all levels
  - Robust and continual upskilling and reskilling, with learning delivered from formal, informal sources



## Digital Natives: The Drivers of Tomorrow's Digital Ecosystems Are Already Arriving

- Digital companies thriving as drivers of digital ecosystems are already hiring digital natives and creating digital workplaces
- For digital natives:
  - The world is on-demand, flexible, and borderless
  - Personal/organizational interfaces are expected to be digital—like the rest of their world



## Future of Learning

- Corporate learning expected to change dramatically in future
  - Increasing presence of digital natives in the workforce will be a primary driver of these changes

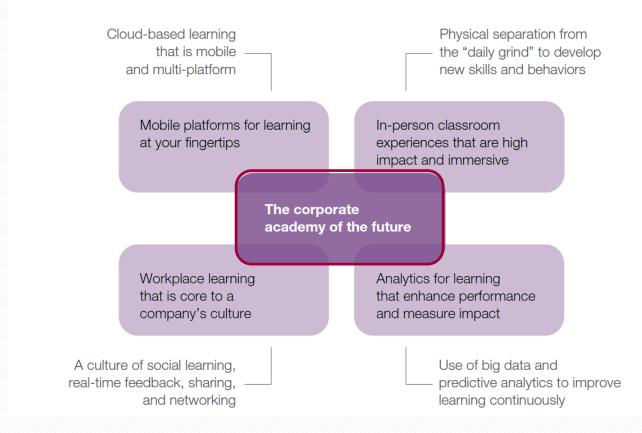
#### • The New Normal:

Content in the cloud, accessed by mobile devices employing multiple learning environments, and often generated, shared and curated by the user community itself



## NextGen Learning Environments: Learning at the Speed of Business

The next generation of corporate academies supports learning at the speed of business.





# Thank You. Questions / Comments

