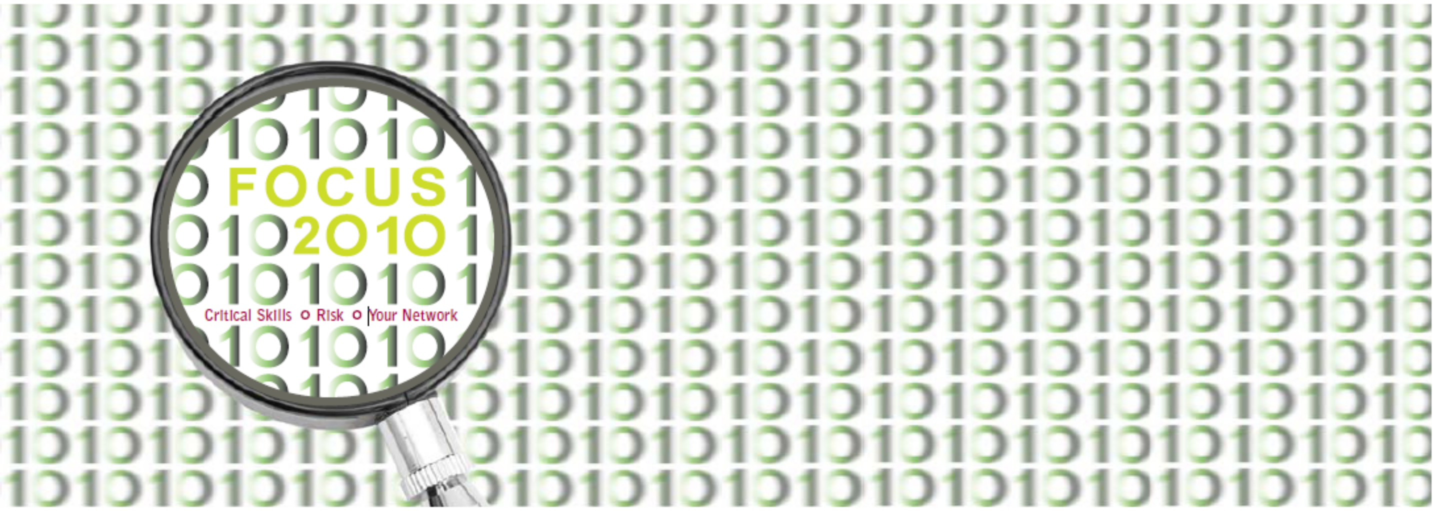
10th Annual SF ISACA Fall Conference

October 4 – 6, 2010



S11: Conducting Enterprise-wide IT Risk Assessments

Lance M. Turcato, City of Phoenix

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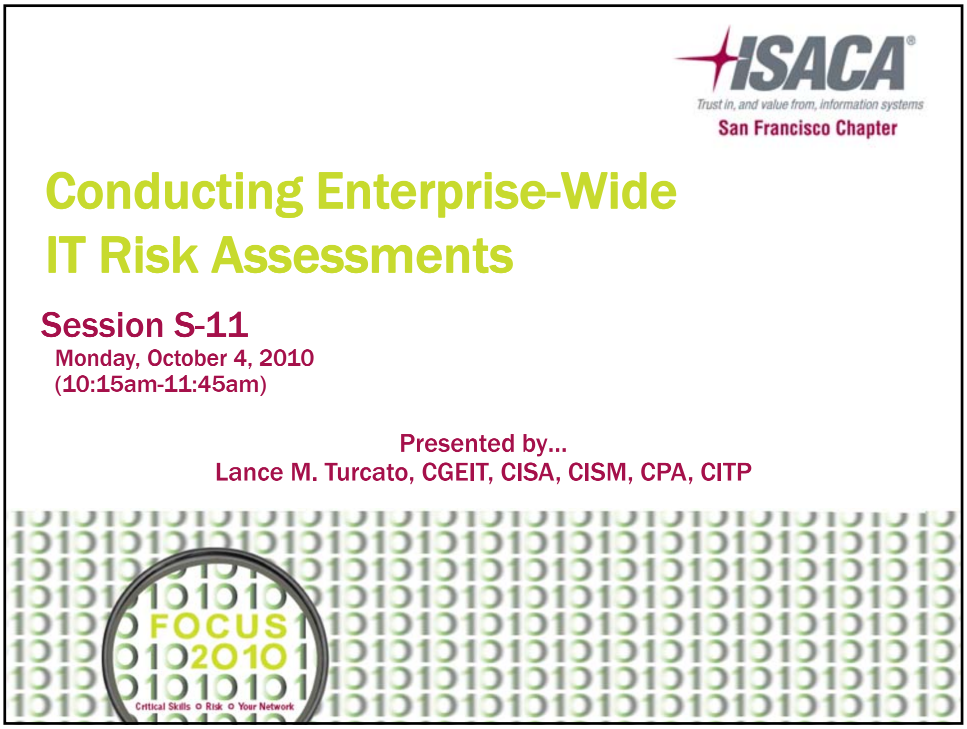

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Conducting Enterprise-Wide IT Risk Assessments

Session S-11

Monday, October 4, 2010
(10:15am-11:45am)

Presented by…
Lance M. Turcato, CGEIT, CISA, CISM, CPA, CITP

FOCUS
2010
Critical Skills ○ Risk ○ Your Network

Agenda

- IT Governance Focus Area (Risk Management)
- IT Governance Frameworks (*Risk* IT)
- General IT Risk Assessment Phases
- Scoring Criteria – Factors to Consider
- Compiling IT Risk Assessment Results
- Leveraging the IT Risk Assessment in Audit Planning
- Ongoing and Annual Updates
- City-wide IT Risk Assessments @ City of Phoenix

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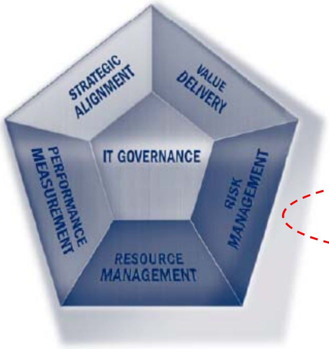
IT Governance (ITG)

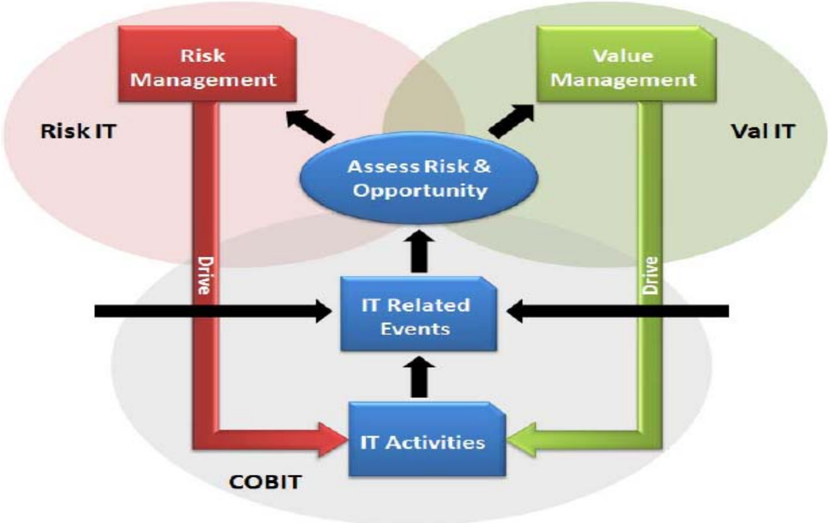
IT Governance Focus Areas

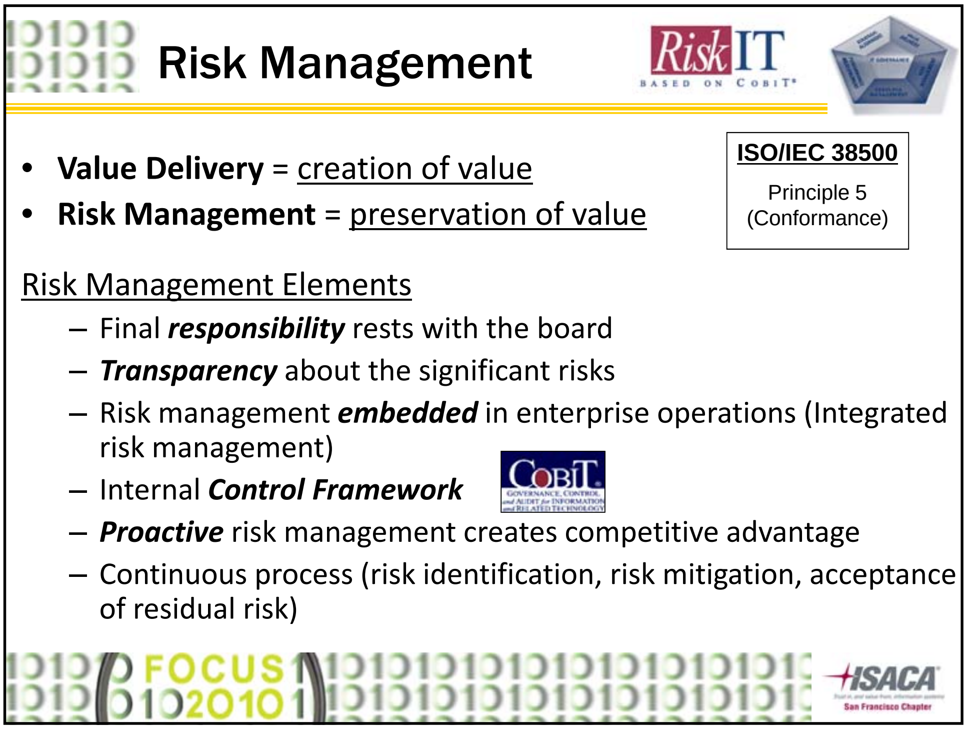


- Strategic Alignment
- Value Delivery
- Risk Management
- Resource Management
- Performance Measurement

Three ITGI Frameworks

Risk IT ™ , *Val*IT ™ , CobiT ™





Risk Management

RiskIT BASED ON COBIT®

ISO/IEC 38500

Principle 5
(Conformance)

- **Value Delivery** = creation of value
- **Risk Management** = preservation of value

Risk Management Elements

- Final ***responsibility*** rests with the board
- ***Transparency*** about the significant risks
- Risk management ***embedded*** in enterprise operations (Integrated risk management)
- Internal ***Control Framework***
- ***Proactive*** risk management creates competitive advantage
- Continuous process (risk identification, risk mitigation, acceptance of residual risk)

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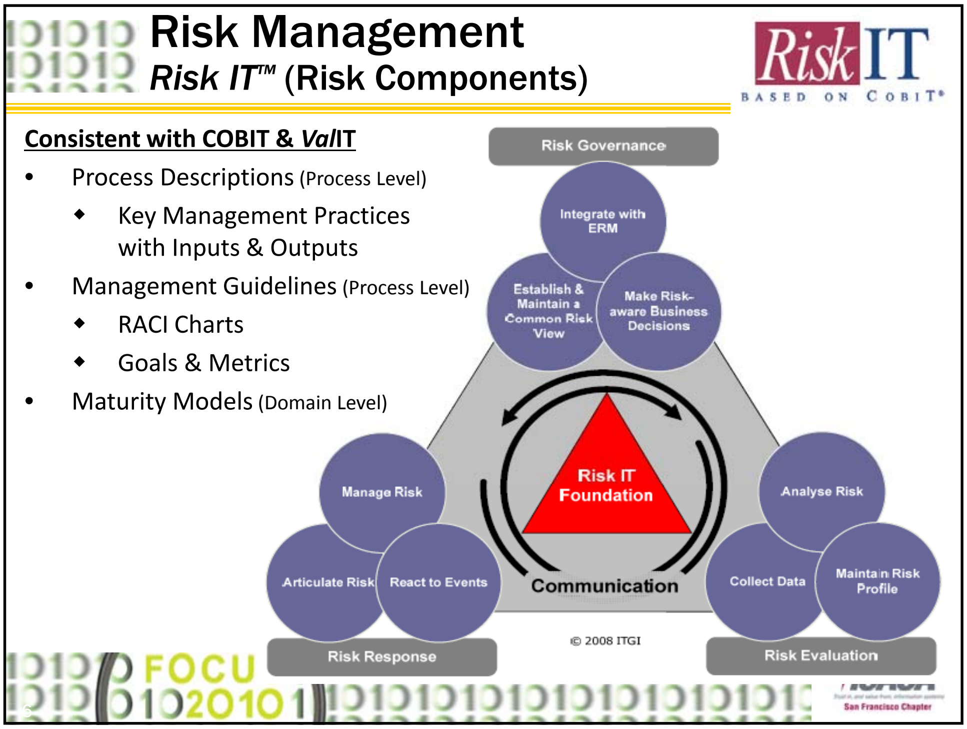

Risk Management

Risk IT™ (Risk Components)

RiskIT BASED ON COBIT®

Consistent with COBIT & *Val*IT

- Process Descriptions (Process Level)
  - Key Management Practices with Inputs & Outputs
- Management Guidelines (Process Level)
  - RACI Charts
  - Goals & Metrics
- Maturity Models (Domain Level)

Risk Governance
Integrate with ERM
Establish & Maintain a Common Risk View
Make Risk-aware Business Decisions
Risk IT Foundation
Communication
Manage Risk
Articulate Risk
React to Events
Risk Response
Analyse Risk
Collect Data
Maintain Risk Profile
Risk Evaluation

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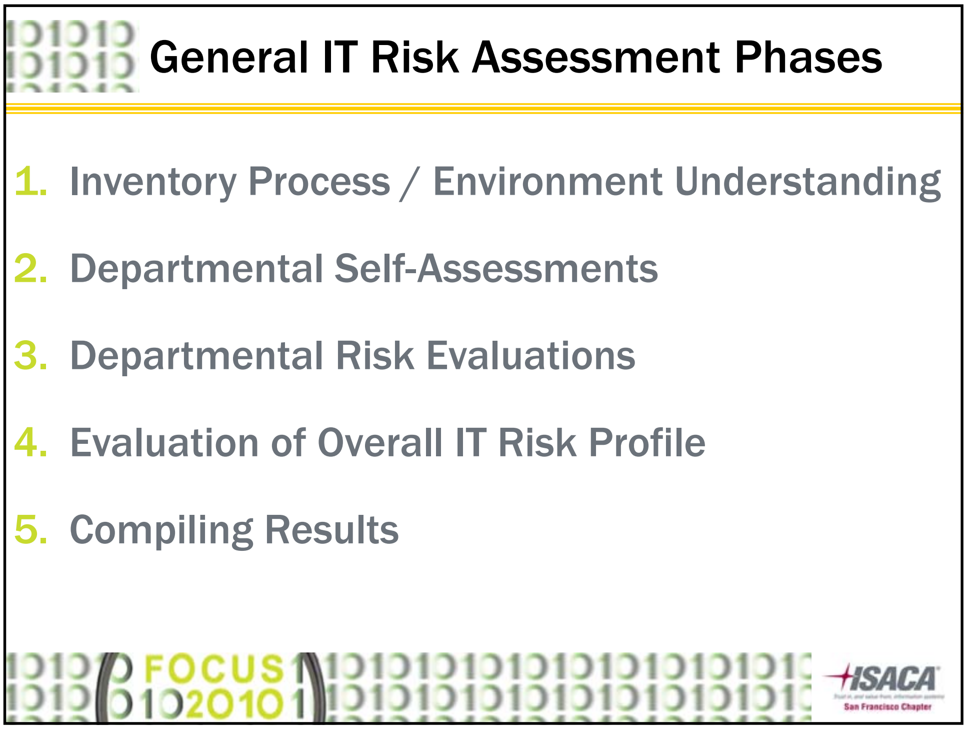
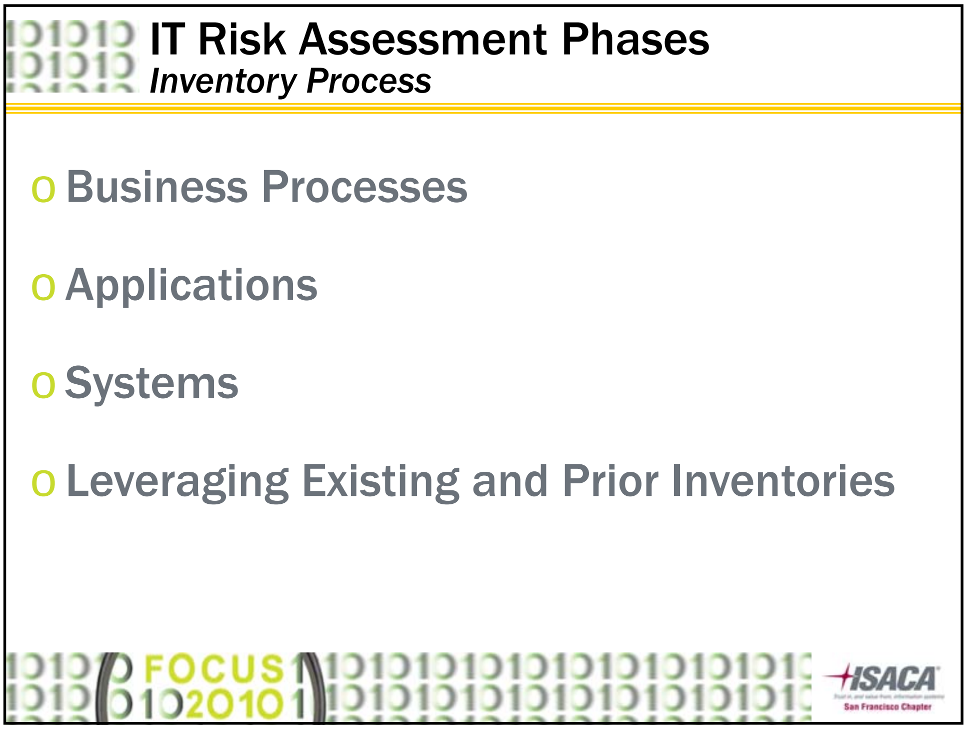


General IT Risk Assessment Phases

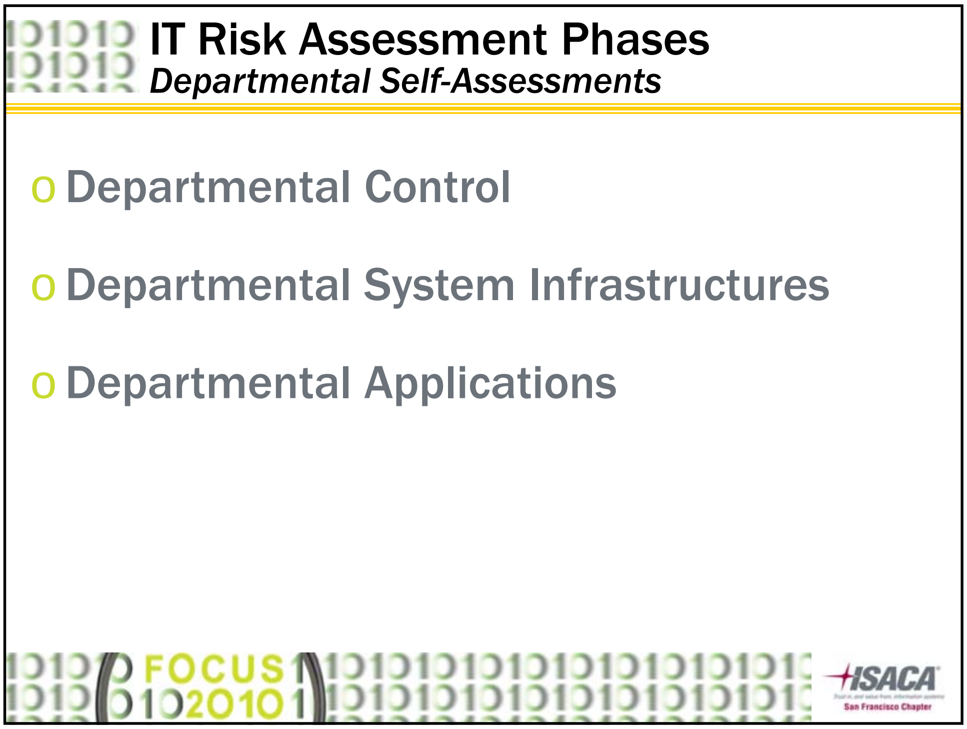
1. Inventory Process / Environment Understanding
2. Departmental Self-Assessments
3. Departmental Risk Evaluations
4. Evaluation of Overall IT Risk Profile
5. Compiling Results



IT Risk Assessment Phases

Inventory Process

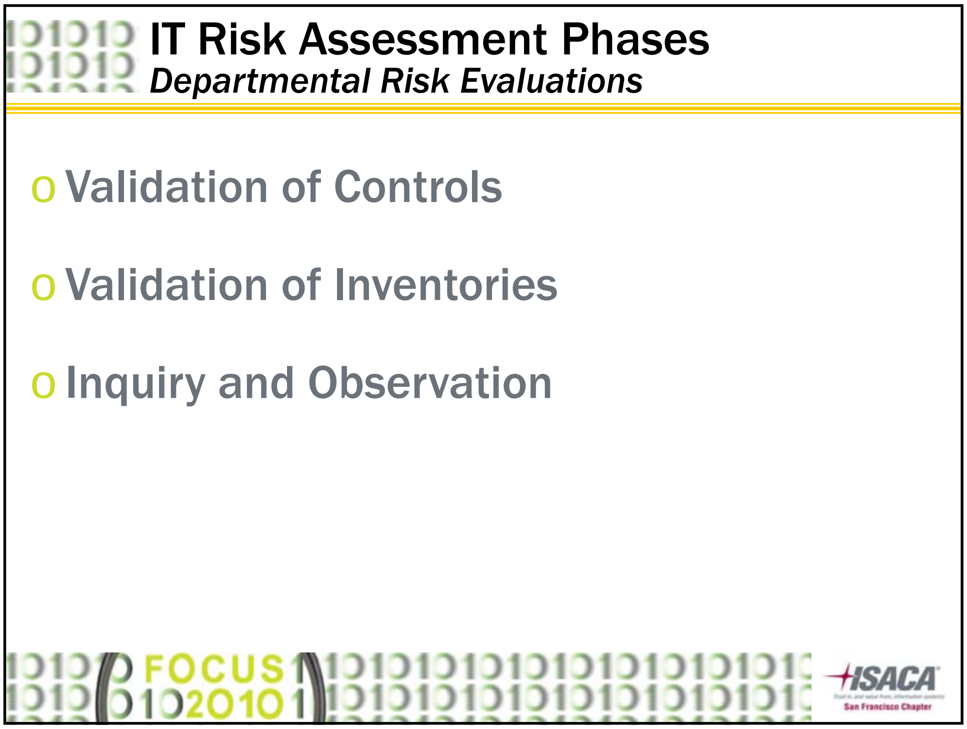
- Business Processes
- Applications
- Systems
- Leveraging Existing and Prior Inventories



IT Risk Assessment Phases

Departmental Self-Assessments

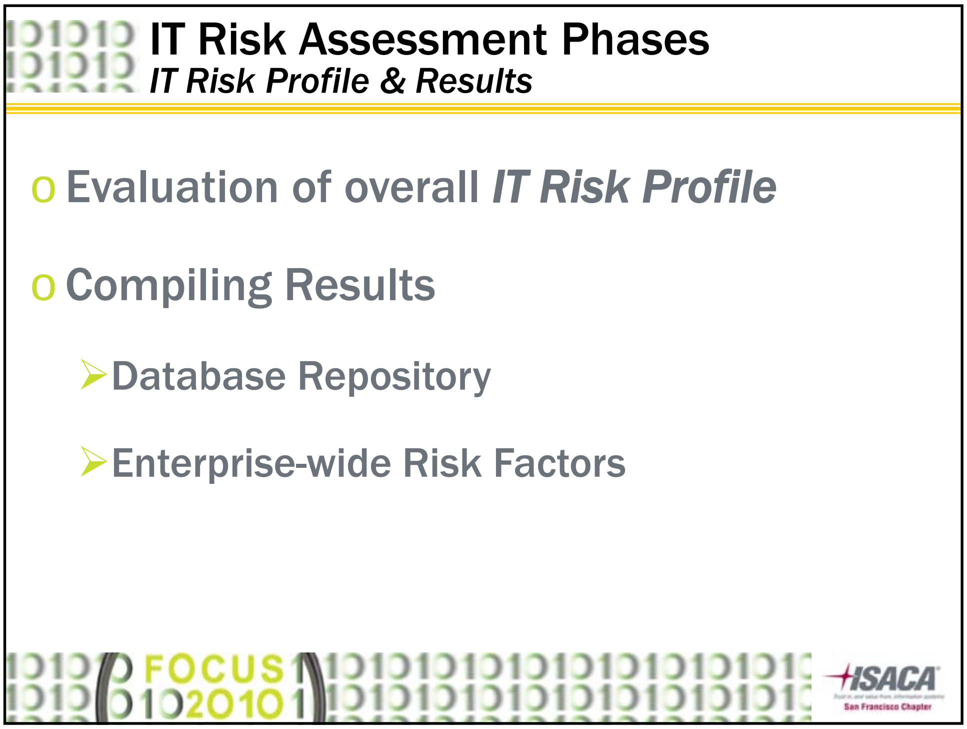
- Departmental Control
- Departmental System Infrastructures
- Departmental Applications



IT Risk Assessment Phases

Departmental Risk Evaluations

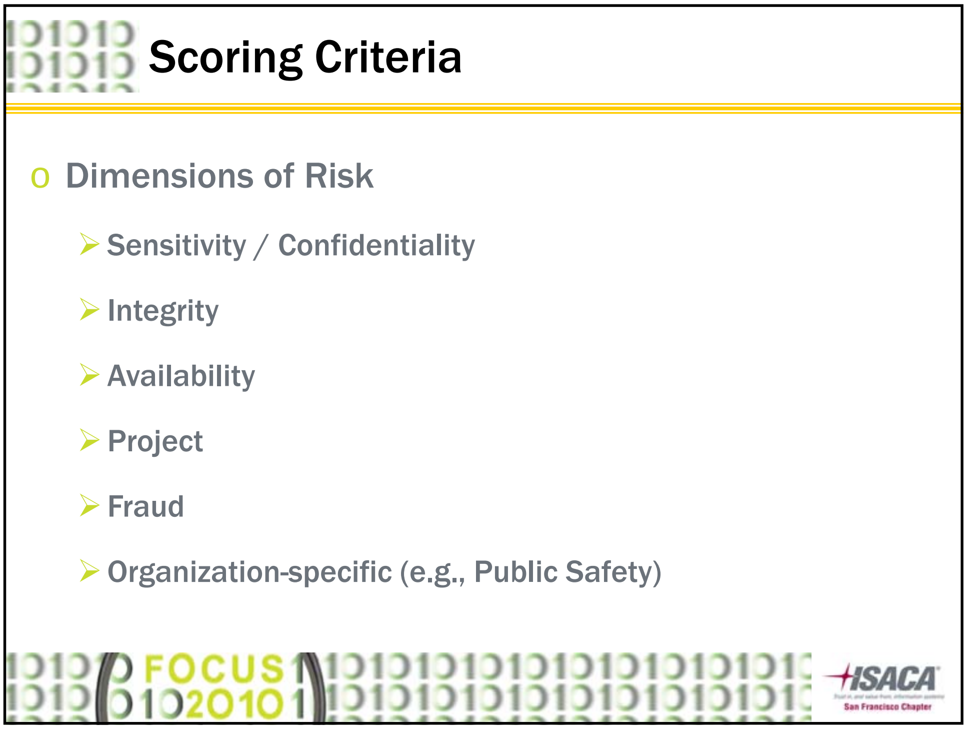
- Validation of Controls
- Validation of Inventories
- Inquiry and Observation



IT Risk Assessment Phases

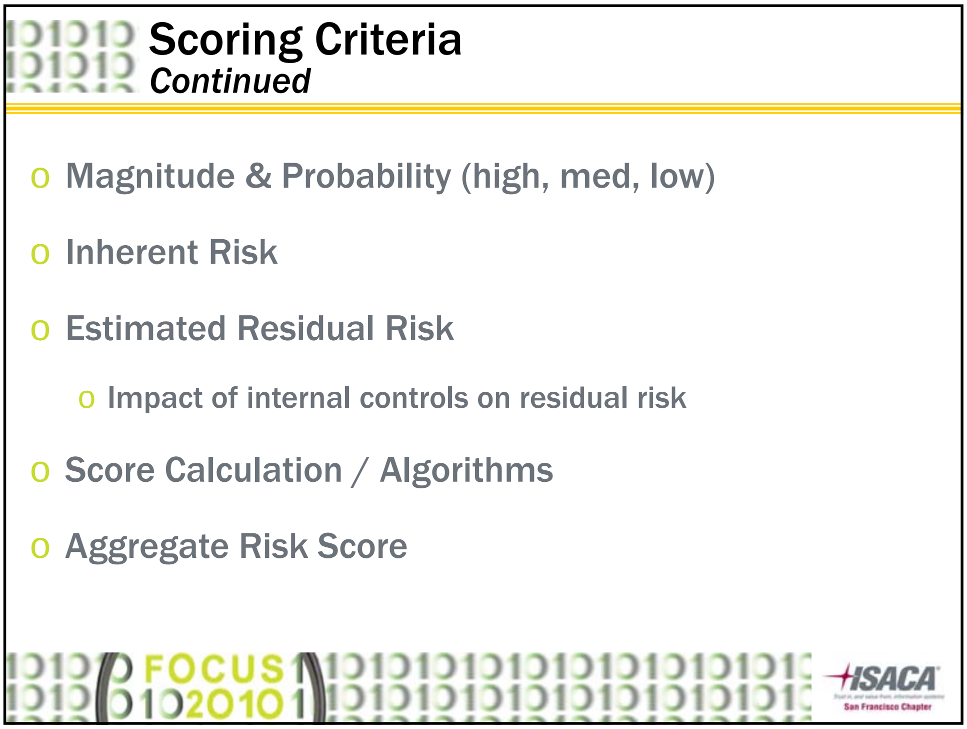
IT Risk Profile & Results

- Evaluation of overall ***IT Risk Profile***
- Compiling Results
  - Database Repository
  - Enterprise-wide Risk Factors



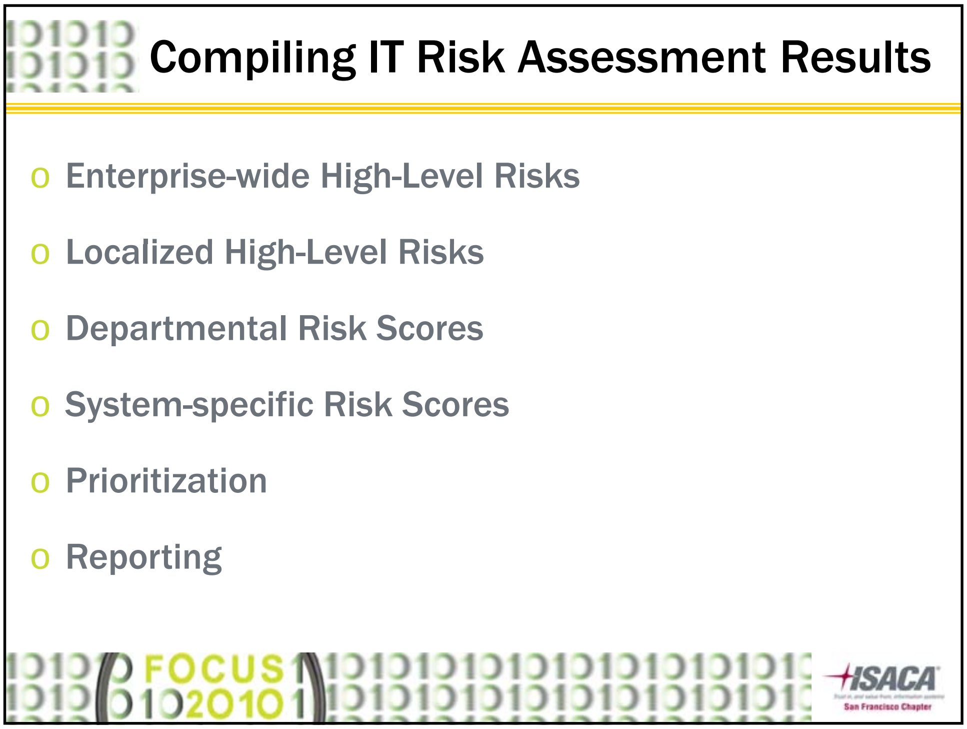
Scoring Criteria

- Dimensions of Risk
  - Sensitivity / Confidentiality
  - Integrity
  - Availability
  - Project
  - Fraud
  - Organization-specific (e.g., Public Safety)



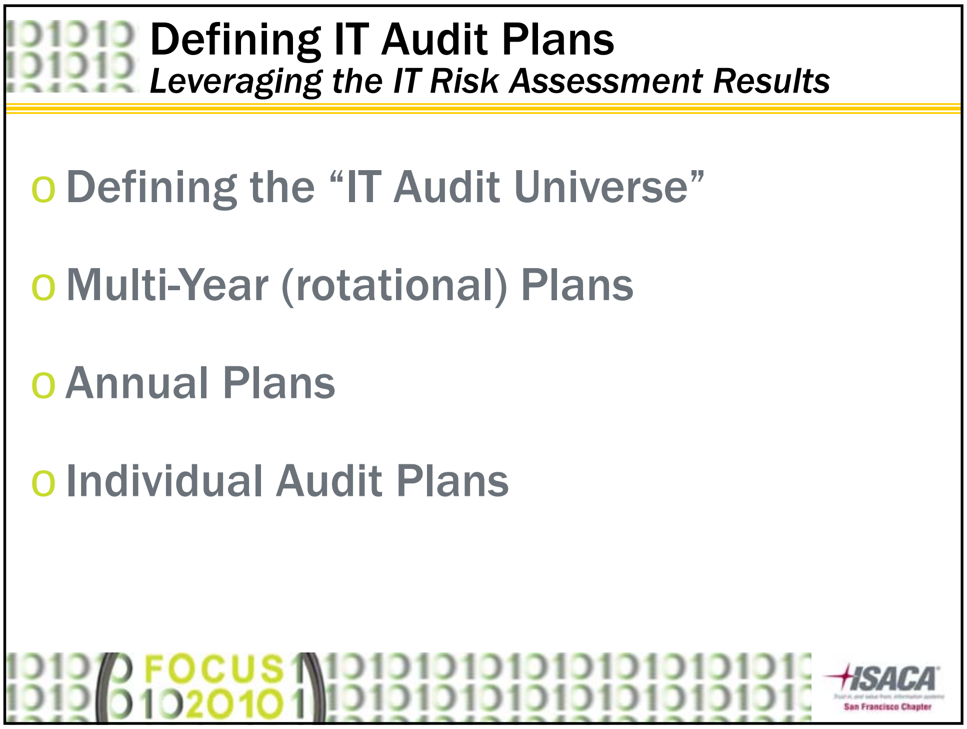
Scoring Criteria
Continued

- Magnitude & Probability (high, med, low)
- Inherent Risk
- Estimated Residual Risk
  - Impact of internal controls on residual risk
- Score Calculation / Algorithms
- Aggregate Risk Score



Compiling IT Risk Assessment Results

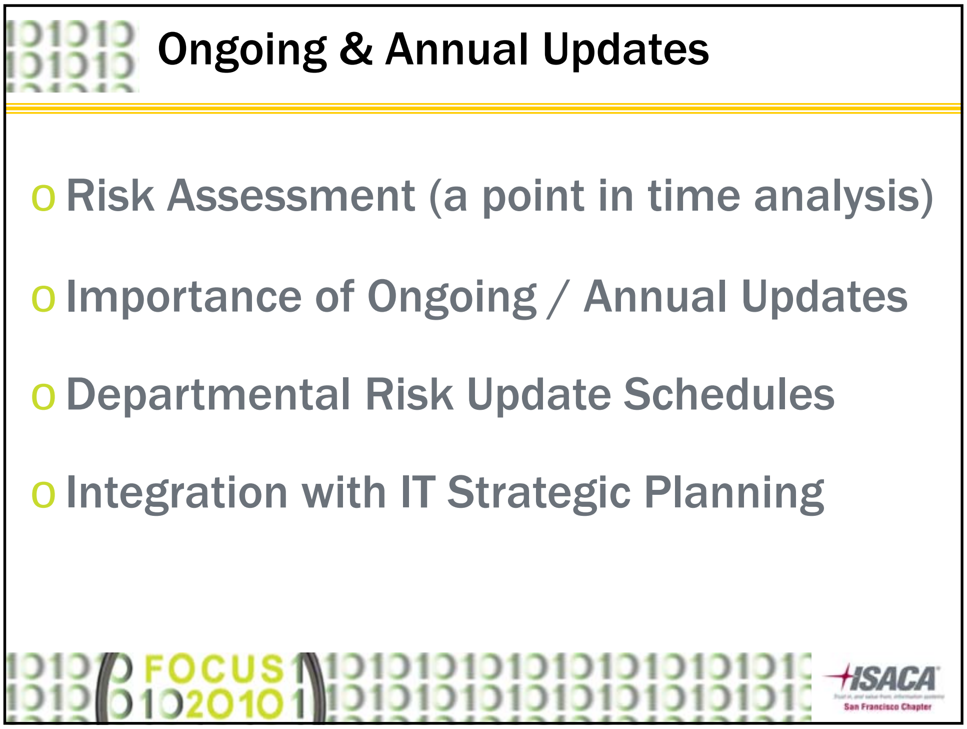
- Enterprise-wide High-Level Risks
- Localized High-Level Risks
- Departmental Risk Scores
- System-specific Risk Scores
- Prioritization
- Reporting



Defining IT Audit Plans

Leveraging the IT Risk Assessment Results

- Defining the "IT Audit Universe"
- Multi-Year (rotational) Plans
- Annual Plans
- Individual Audit Plans



Ongoing & Annual Updates

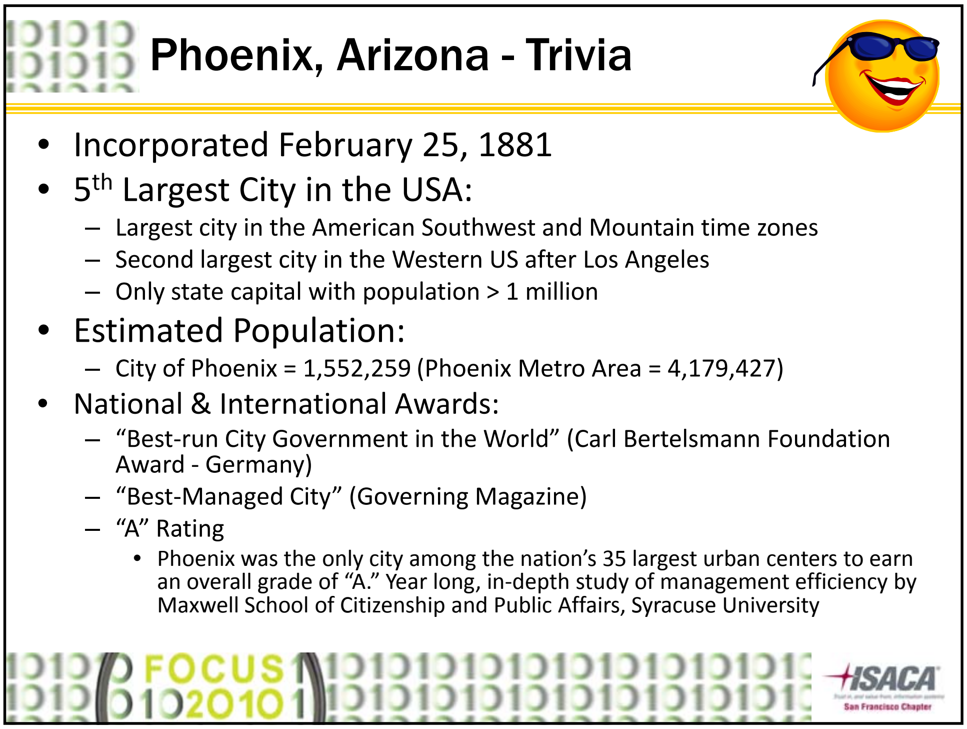
- Risk Assessment (a point in time analysis)
- Importance of Ongoing / Annual Updates
- Departmental Risk Update Schedules
- Integration with IT Strategic Planning

City-wide IT Risk Assessments at...

City of Phoenix

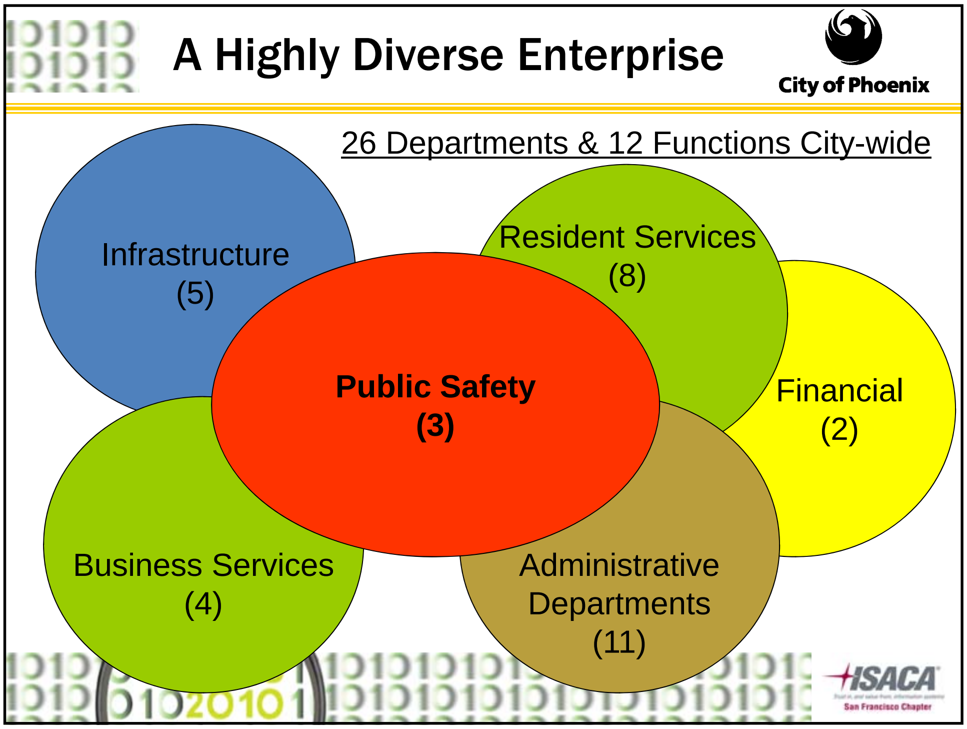
What's Unique about Public Sector?

Private Sector (for profit)	- vs -	Public Sector (Not-for-Profit)
Profit **Motivation**	**A.**	"Efficiency" Motivation
Clearer hierarchical **accountability** environments	**B.**	More complex, political accountability environments
More flexibility to decide & to **execute quickly**	**C.**	Less flexibility to decide & execute quickly
Board/Shareholder **exposure/oversight**	**D.**	Board + More intense public exposure/oversight
Limits on required information **disclosure**	**E.**	Freedom of Information Acts / dictated disclosure
Higher tolerance of **discretionary spending** – less demand for full fiscal transparency	**F.**	More limited tolerance for discretionary spending and more demand for full fiscal transparency
Management often has more ability to effect **cultural change** within their span of control	**G.**	Difficult to effect significant cultural change and make it "stick" long-term – even within a span of control
Most products and services are delivered in a fully **competitive market place**	**H.**	Most products & services are delivered to regulated markets that are less-than fully-competitive
Customers "vote with their feet" & "wallets"	**I.**	Customer has limited choices re: product/services



Phoenix, Arizona - Trivia

- Incorporated February 25, 1881
- 5th Largest City in the USA:
  - Largest city in the American Southwest and Mountain time zones
  - Second largest city in the Western US after Los Angeles
  - Only state capital with population > 1 million
- Estimated Population:
  - City of Phoenix = 1,552,259 (Phoenix Metro Area = 4,179,427)
- National & International Awards:
  - "Best-run City Government in the World" (Carl Bertelsmann Foundation Award - Germany)
  - "Best-Managed City" (Governing Magazine)
  - "A" Rating
    - Phoenix was the only city among the nation's 35 largest urban centers to earn an overall grade of "A." Year long, in-depth study of management efficiency by Maxwell School of Citizenship and Public Affairs, Syracuse University



A Highly Diverse Enterprise

City of Phoenix

26 Departments & 12 Functions City-wide

Infrastructure (5)

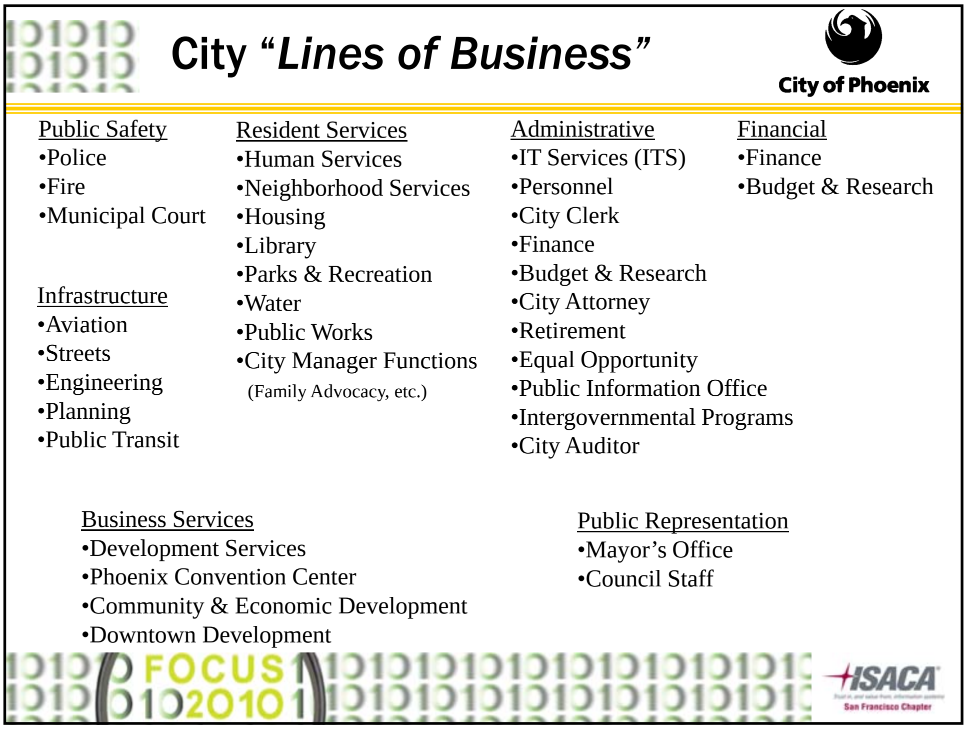
Resident Services (8)

Public Safety (3)

Financial (2)

Business Services (4)

Administrative Departments (11)



City “*Lines of Business*”

City of Phoenix

Public Safety
- Police
- Fire
- Municipal Court

Infrastructure
- Aviation
- Streets
- Engineering
- Planning
- Public Transit

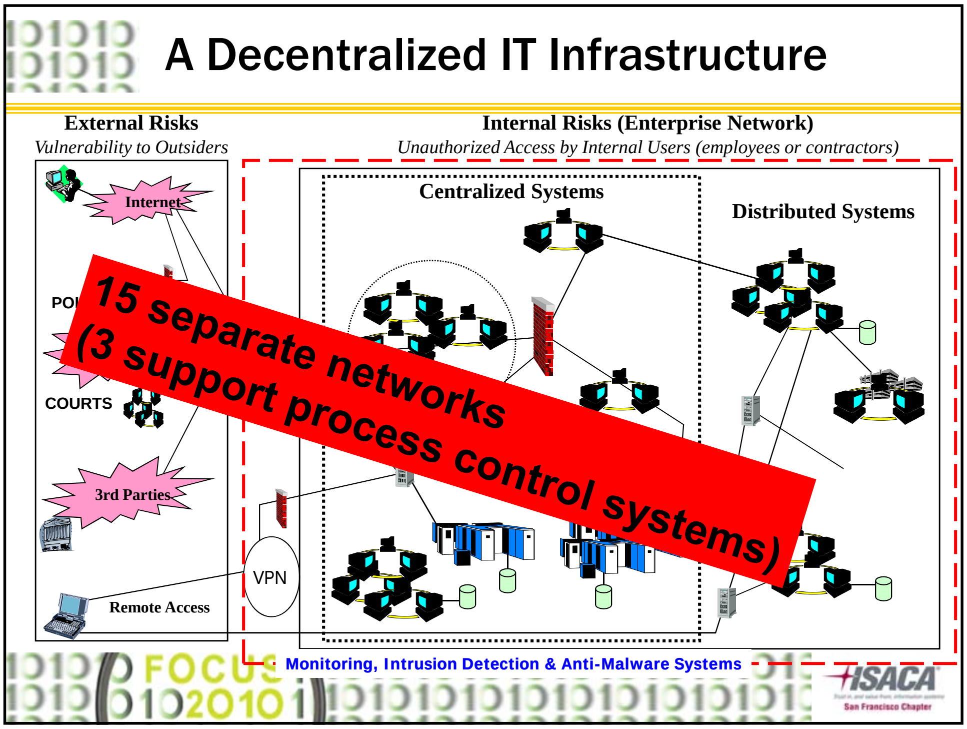
Resident Services
- Human Services
- Neighborhood Services
- Housing
- Library
- Parks & Recreation
- Water
- Public Works
- City Manager Functions (Family Advocacy, etc.)

Administrative
- IT Services (ITS)
- Personnel
- City Clerk
- Finance
- Budget & Research
- City Attorney
- Retirement
- Equal Opportunity
- Public Information Office
- Intergovernmental Programs
- City Auditor

Financial
- Finance
- Budget & Research

Business Services
- Development Services
- Phoenix Convention Center
- Community & Economic Development
- Downtown Development

Public Representation
- Mayor’s Office
- Council Staff



A Decentralized IT Infrastructure

External Risks

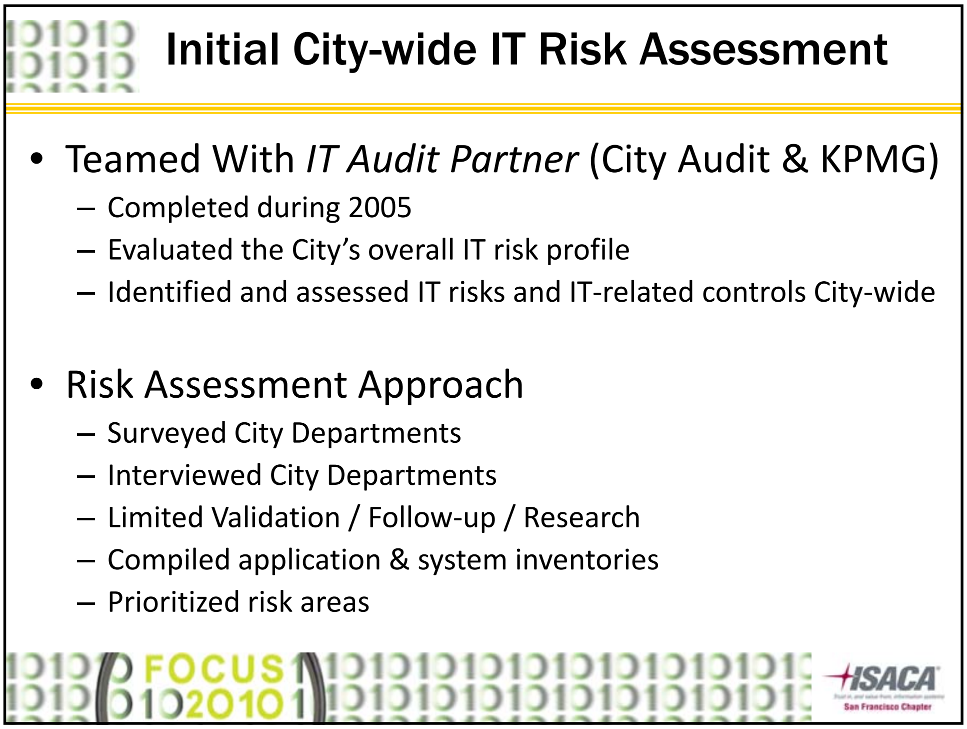
Vulnerability to Outsiders

Internal Risks (Enterprise Network)

Unauthorized Access by Internal Users (employees or contractors)

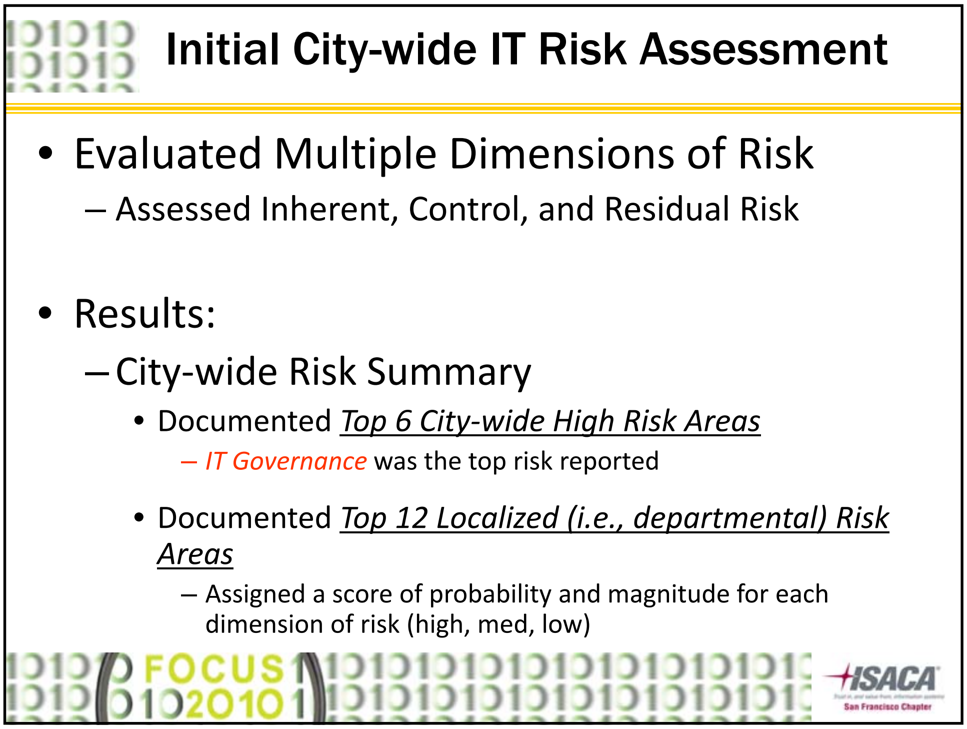
15 separate networks
(3 support process control systems)

Monitoring, Intrusion Detection & Anti-Malware Systems



Initial City-wide IT Risk Assessment

- Teamed With *IT Audit Partner* (City Audit & KPMG)
  - Completed during 2005
  - Evaluated the City's overall IT risk profile
  - Identified and assessed IT risks and IT-related controls City-wide
- Risk Assessment Approach
  - Surveyed City Departments
  - Interviewed City Departments
  - Limited Validation / Follow-up / Research
  - Compiled application & system inventories
  - Prioritized risk areas



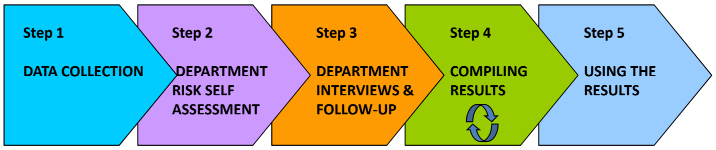
Initial City-wide IT Risk Assessment

- Evaluated Multiple Dimensions of Risk
  - Assessed Inherent, Control, and Residual Risk
- Results:
  - City-wide Risk Summary
    - Documented ***Top 6 City-wide High Risk Areas***
      - *IT Governance* was the top risk reported
    - Documented ***Top 12 Localized (i.e., departmental) Risk Areas***
      - Assigned a score of probability and magnitude for each dimension of risk (high, med, low)

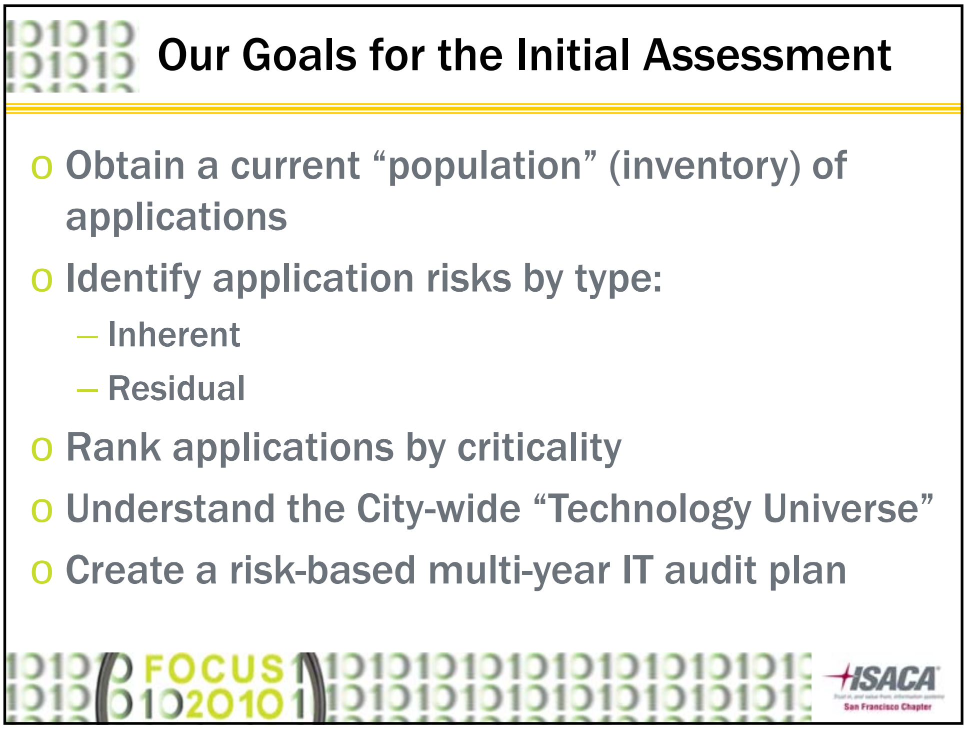
Initial City-wide IT Risk Assessment

- Departmental Risk Summary
- Prioritized System / Application Inventory
  - Prioritized City-wide inventory of systems and applications
- Application Assessment
  - ***Population:*** 467 systems / applications used throughout the City
  - ***Critical Applications:*** 104 applications supporting critical operational and financial activities
  - ***Sensitive Data:*** 159 applications process or store sensitive / confidential information
  - ***Vendor Support:*** 290 systems / applications no longer supported
  - ***Home-Grown Applications:*** 121 applications internally developed

Overview of Our Initial Approach

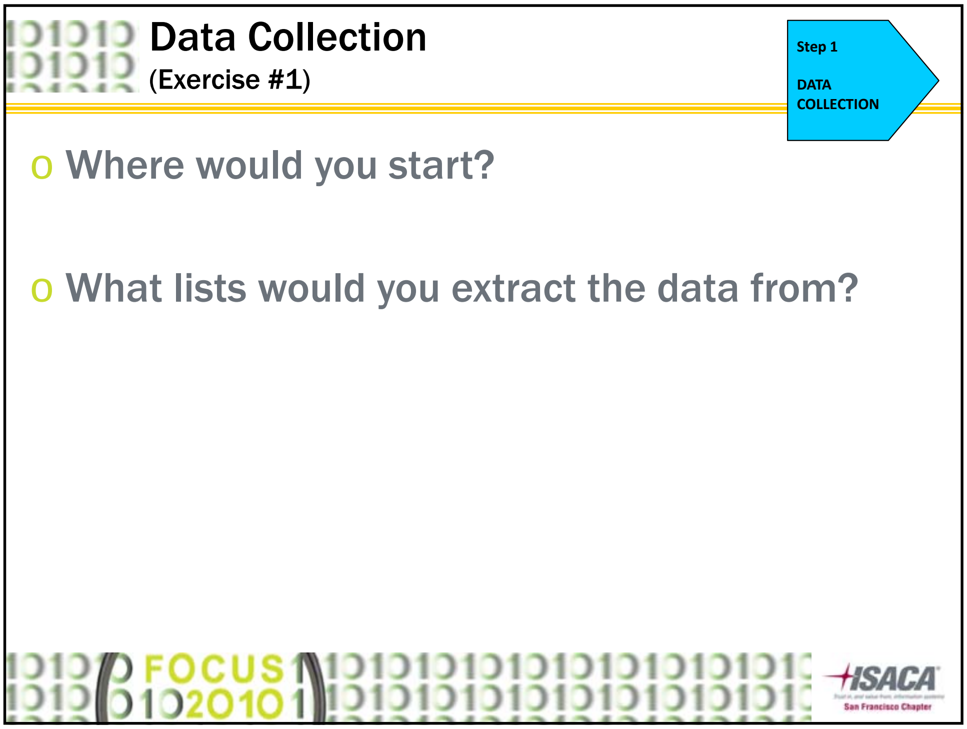


- 1 – Data Collection
  - ✓ Update Technology Environment Understanding
  - ✓ Update Application Inventory
- 2 – Facilitate Department Risk Self-Assessments
- 3 – Follow-up On Data Collection / Assessments
- 4 – Compile Results
- 5 – Using the Results



Our Goals for the Initial Assessment

- Obtain a current “population” (inventory) of applications
- Identify application risks by type:
  - Inherent
  - Residual
- Rank applications by criticality
- Understand the City-wide “Technology Universe”
- Create a risk-based multi-year IT audit plan



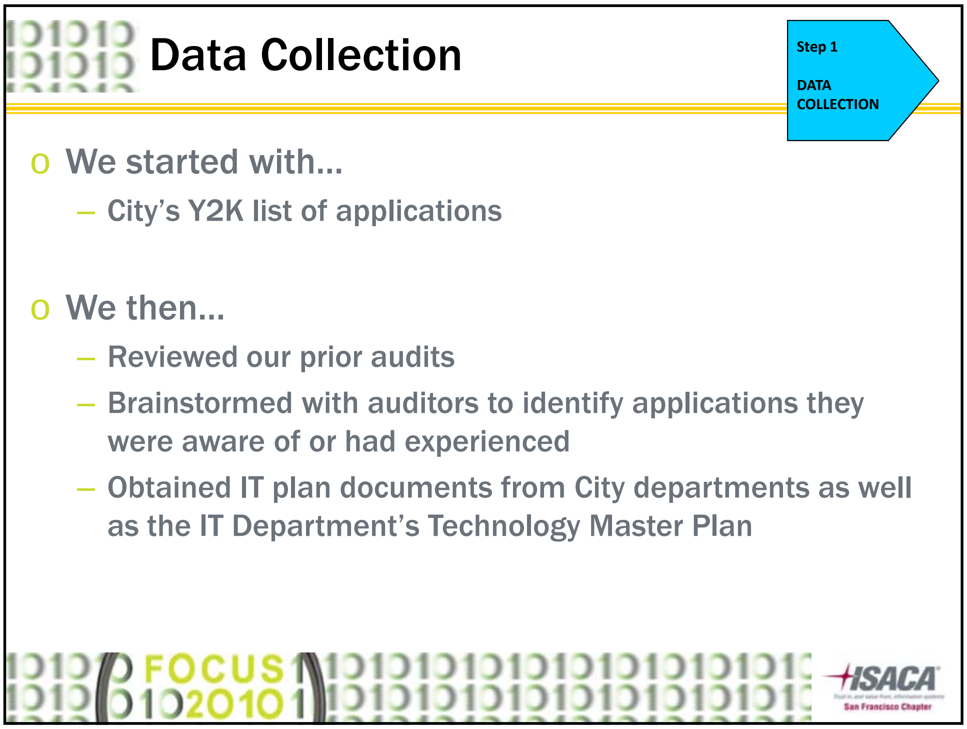
Data Collection

(Exercise #1)

Step 1
DATA COLLECTION

- Where would you start?

- What lists would you extract the data from?

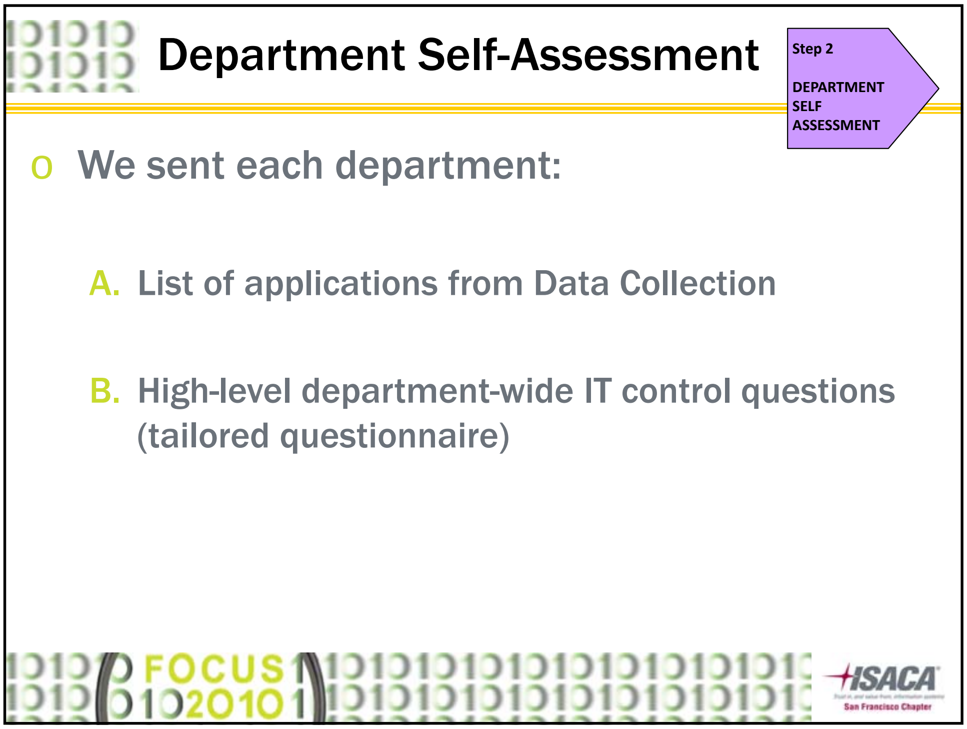


Data Collection

Step 1

DATA COLLECTION

- We started with…
  - City's Y2K list of applications
- We then…
  - Reviewed our prior audits
  - Brainstormed with auditors to identify applications they were aware of or had experienced
  - Obtained IT plan documents from City departments as well as the IT Department's Technology Master Plan



Department Self-Assessment

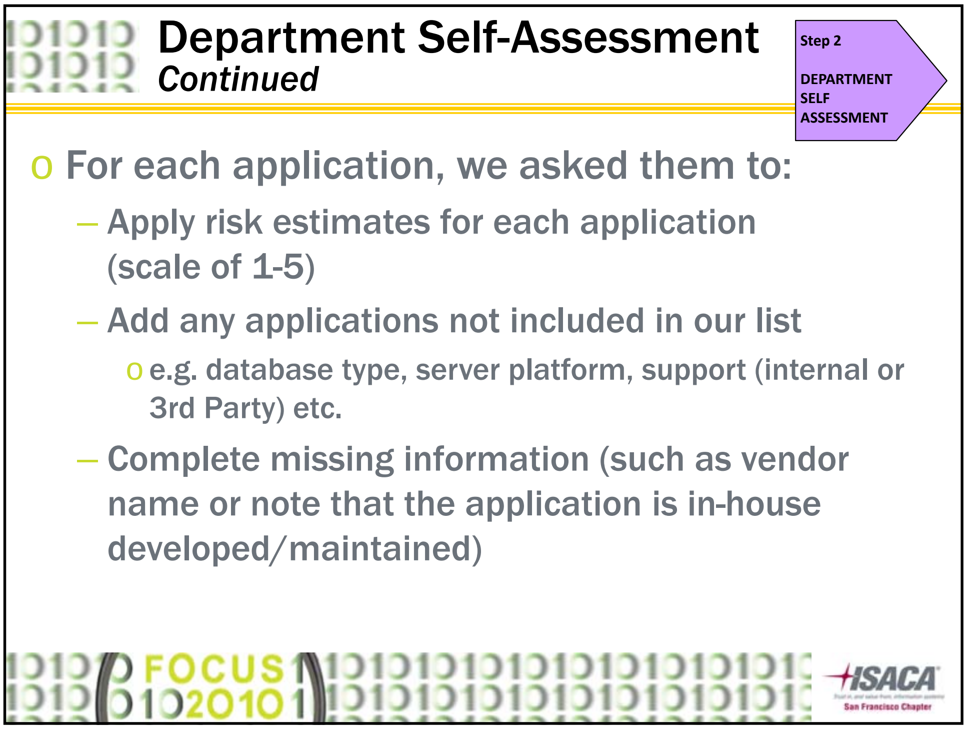
Step 2

DEPARTMENT SELF ASSESSMENT

- We sent each department:

  A. List of applications from Data Collection

  B. High-level department-wide IT control questions (tailored questionnaire)

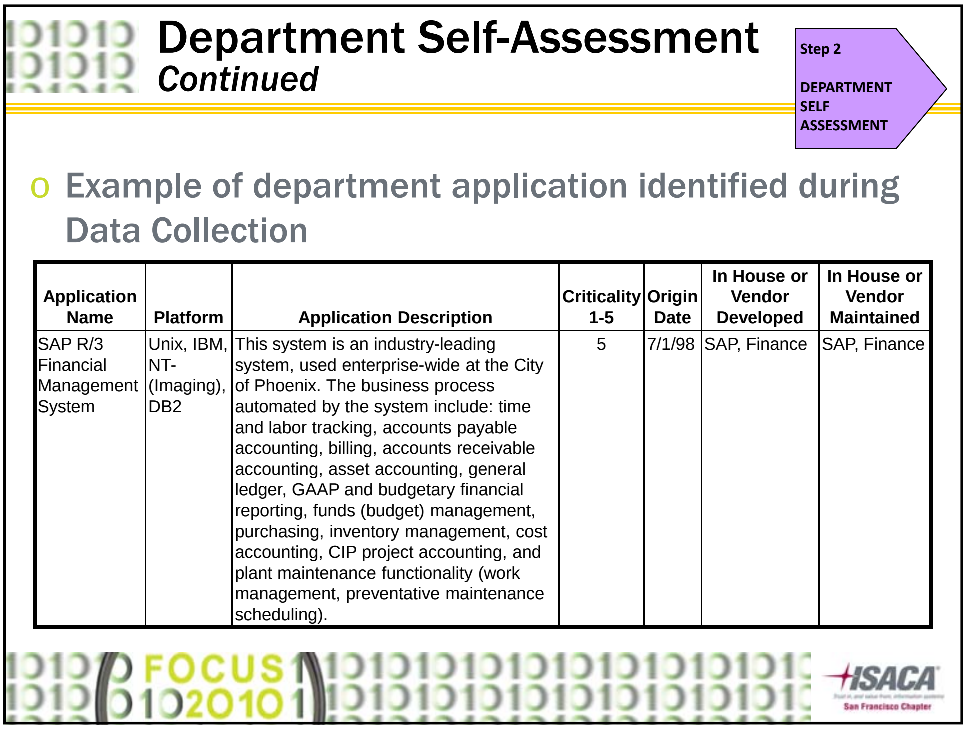


Department Self-Assessment
Continued

Step 2

DEPARTMENT SELF ASSESSMENT

- For each application, we asked them to:
  - Apply risk estimates for each application (scale of 1-5)
  - Add any applications not included in our list
    - e.g. database type, server platform, support (internal or 3rd Party) etc.
  - Complete missing information (such as vendor name or note that the application is in-house developed/maintained)



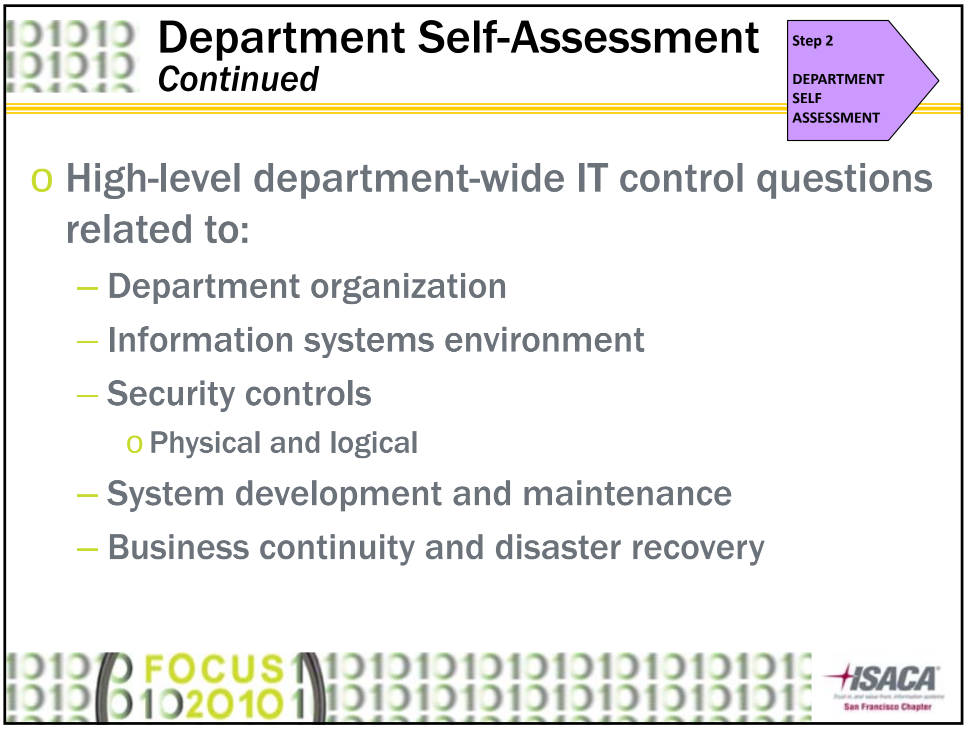
Department Self-Assessment
Continued

Step 2

DEPARTMENT SELF ASSESSMENT

- Example of department application identified during Data Collection

Application Name	Platform	Application Description	Criticality 1-5	Origin Date	In House or Vendor Developed	In House or Vendor Maintained
SAP R/3 Financial Management System	Unix, IBM, NT-(Imaging), DB2	This system is an industry-leading system, used enterprise-wide at the City of Phoenix. The business process automated by the system include: time and labor tracking, accounts payable accounting, billing, accounts receivable accounting, asset accounting, general ledger, GAAP and budgetary financial reporting, funds (budget) management, purchasing, inventory management, cost accounting, CIP project accounting, and plant maintenance functionality (work management, preventative maintenance scheduling).	5	7/1/98	SAP, Finance	SAP, Finance

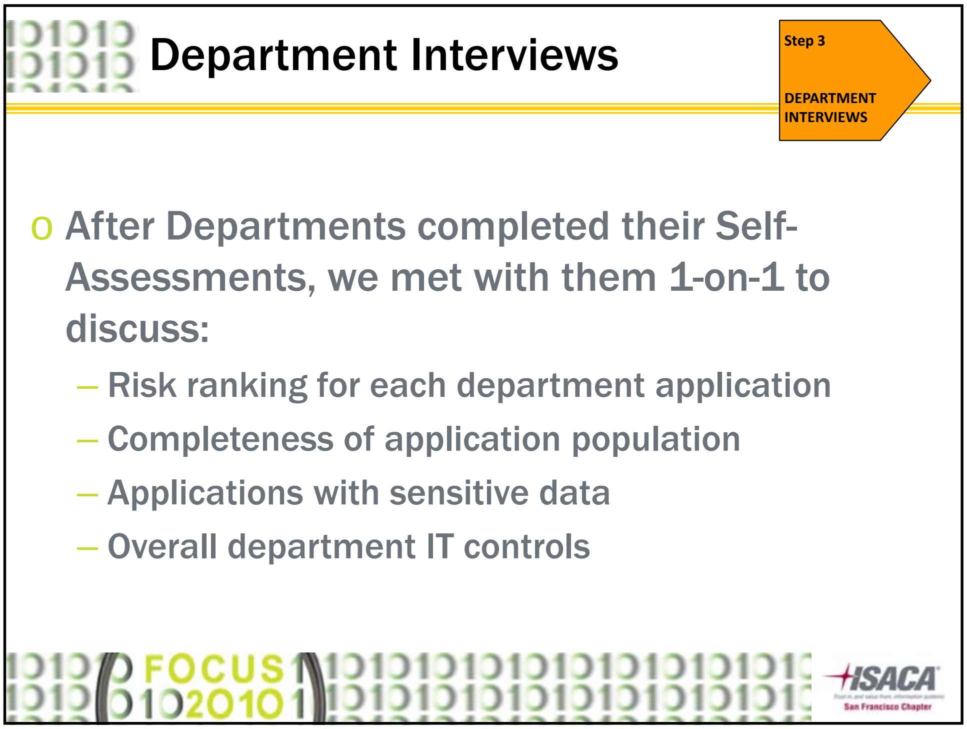


Department Self-Assessment *Continued*

Step 2

DEPARTMENT SELF ASSESSMENT

- High-level department-wide IT control questions related to:
  - Department organization
  - Information systems environment
  - Security controls
    - Physical and logical
  - System development and maintenance
  - Business continuity and disaster recovery

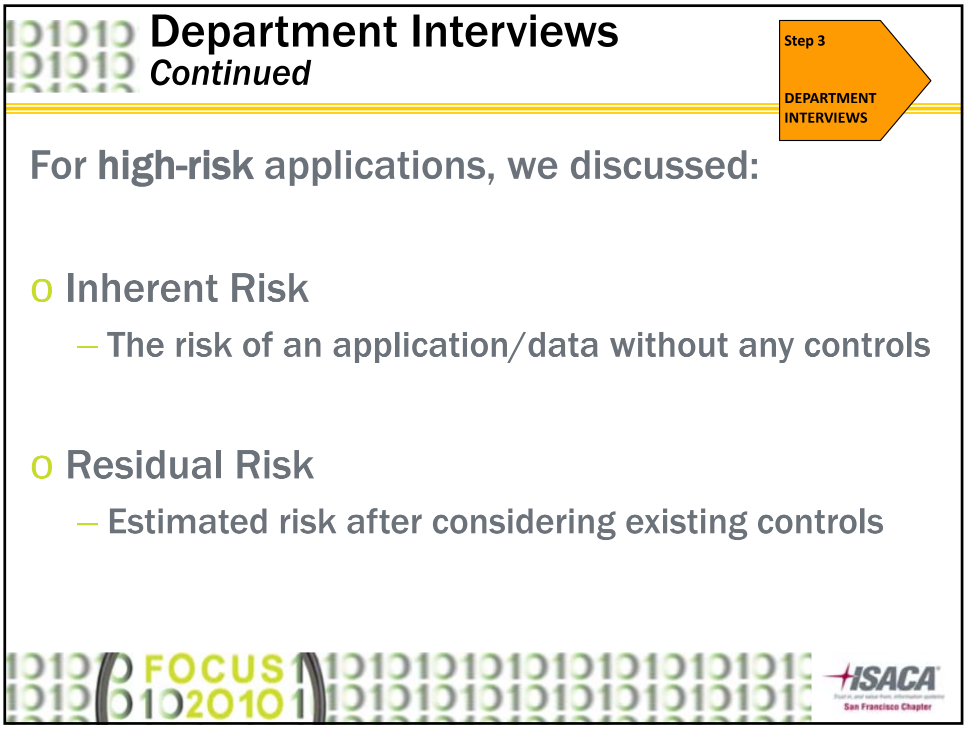


Department Interviews

Step 3

DEPARTMENT INTERVIEWS

- After Departments completed their Self-Assessments, we met with them 1-on-1 to discuss:
  - Risk ranking for each department application
  - Completeness of application population
  - Applications with sensitive data
  - Overall department IT controls



Department Interviews

Continued

Step 3

DEPARTMENT INTERVIEWS

For **high-risk** applications, we discussed:

- Inherent Risk
  - The risk of an application/data without any controls
- Residual Risk
  - Estimated risk after considering existing controls

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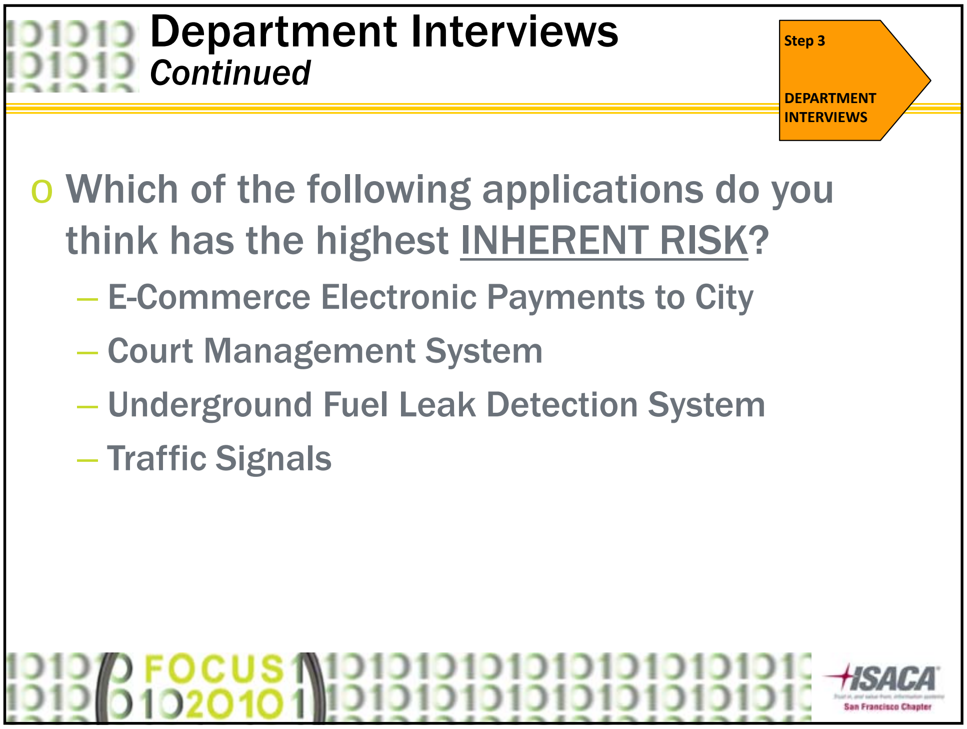

Department Interviews

Continued

Step 3

DEPARTMENT INTERVIEWS

- Which of the following applications do you think has the highest INHERENT RISK?
  - E-Commerce Electronic Payments to City
  - Court Management System
  - Underground Fuel Leak Detection System
  - Traffic Signals

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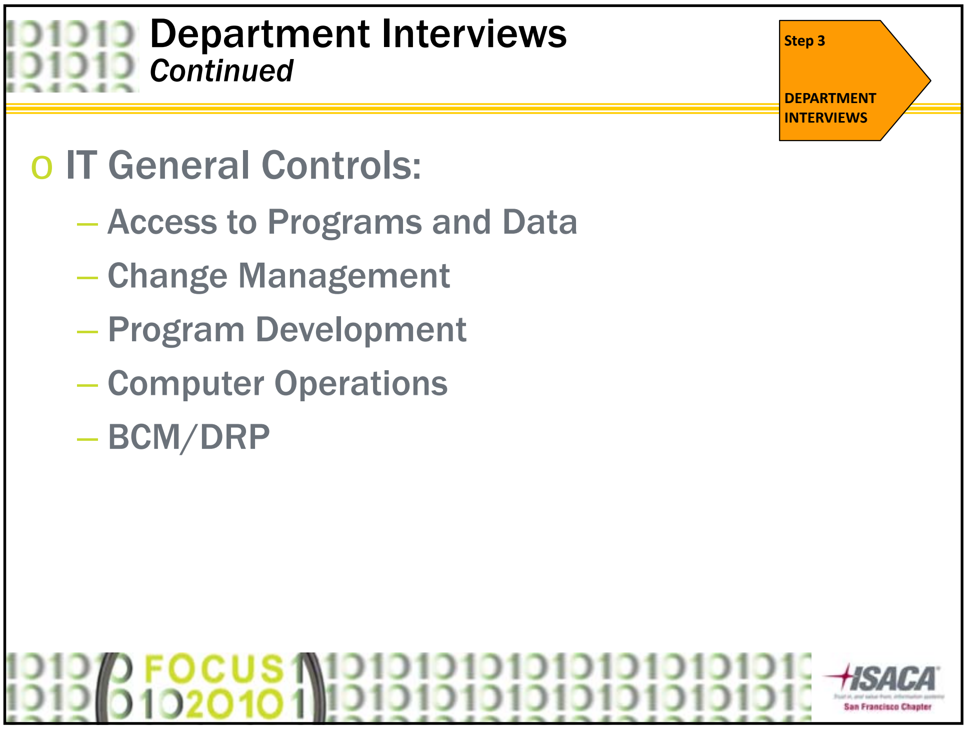
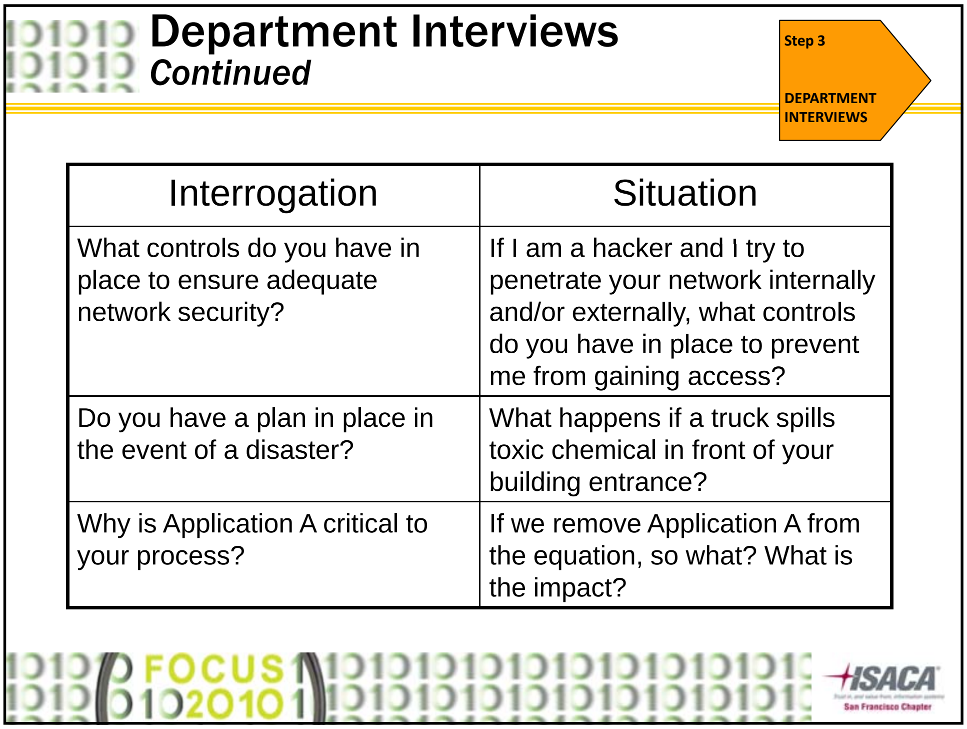


Department Interviews
Continued

Step 3

DEPARTMENT INTERVIEWS

- IT General Controls:
  - Access to Programs and Data
  - Change Management
  - Program Development
  - Computer Operations
  - BCM/DRP

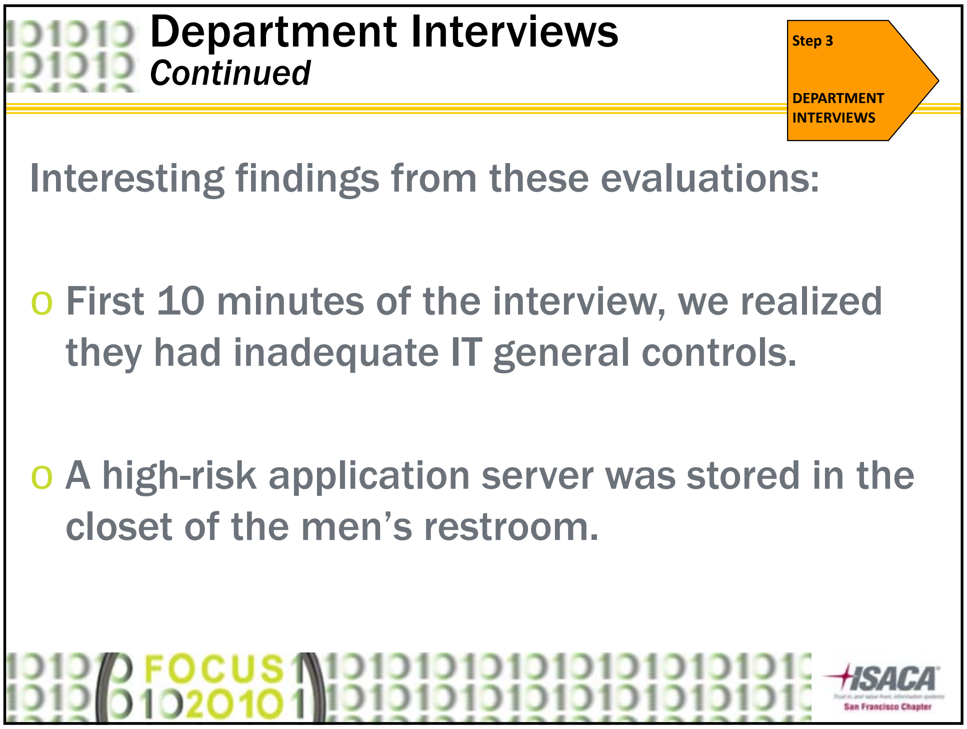


Department Interviews
Continued

Step 3

DEPARTMENT INTERVIEWS

Interrogation	Situation
What controls do you have in place to ensure adequate network security?	If I am a hacker and I try to penetrate your network internally and/or externally, what controls do you have in place to prevent me from gaining access?
Do you have a plan in place in the event of a disaster?	What happens if a truck spills toxic chemical in front of your building entrance?
Why is Application A critical to your process?	If we remove Application A from the equation, so what? What is the impact?



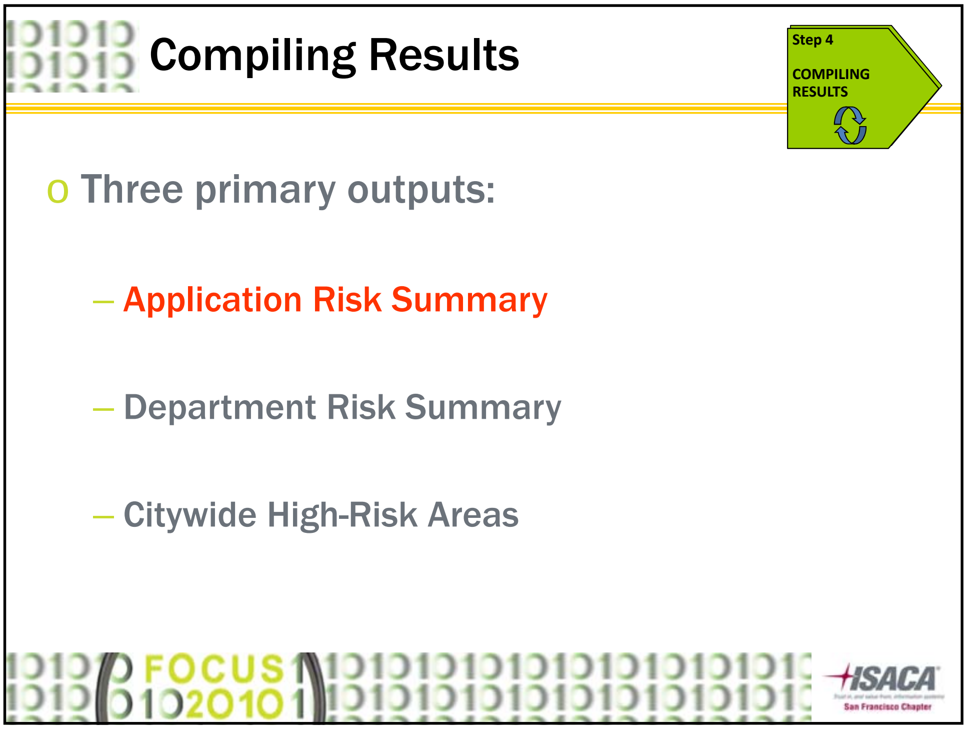
Department Interviews
Continued

Step 3

DEPARTMENT INTERVIEWS

Interesting findings from these evaluations:

- First 10 minutes of the interview, we realized they had inadequate IT general controls.
- A high-risk application server was stored in the closet of the men’s restroom.

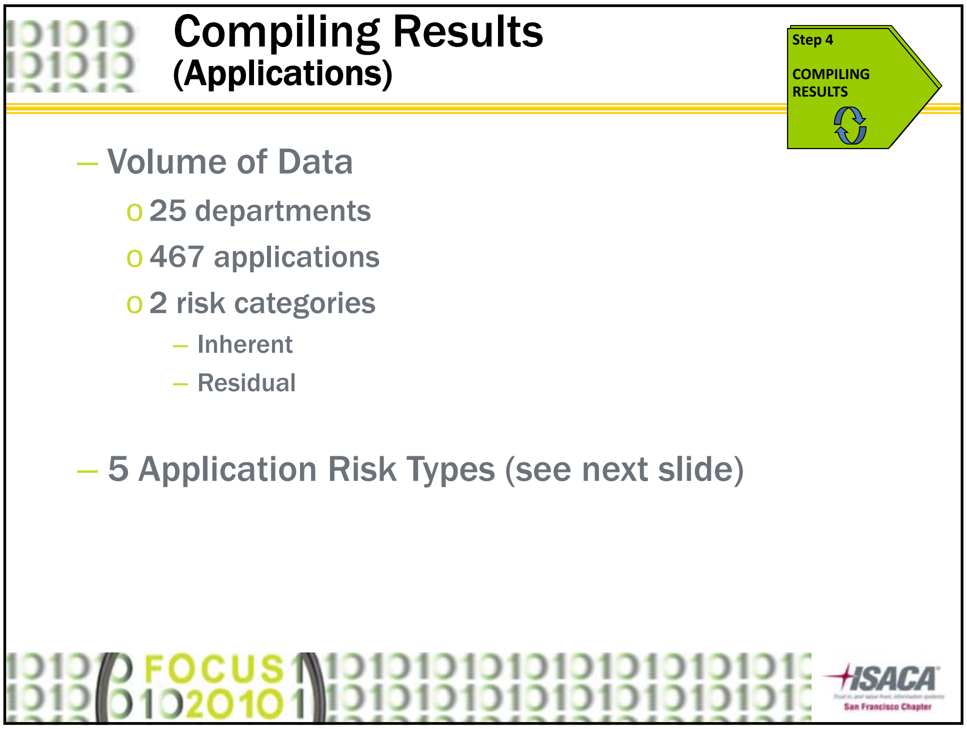


Compiling Results

Step 4

COMPILING RESULTS

- Three primary outputs:
  - Application Risk Summary
  - Department Risk Summary
  - Citywide High-Risk Areas

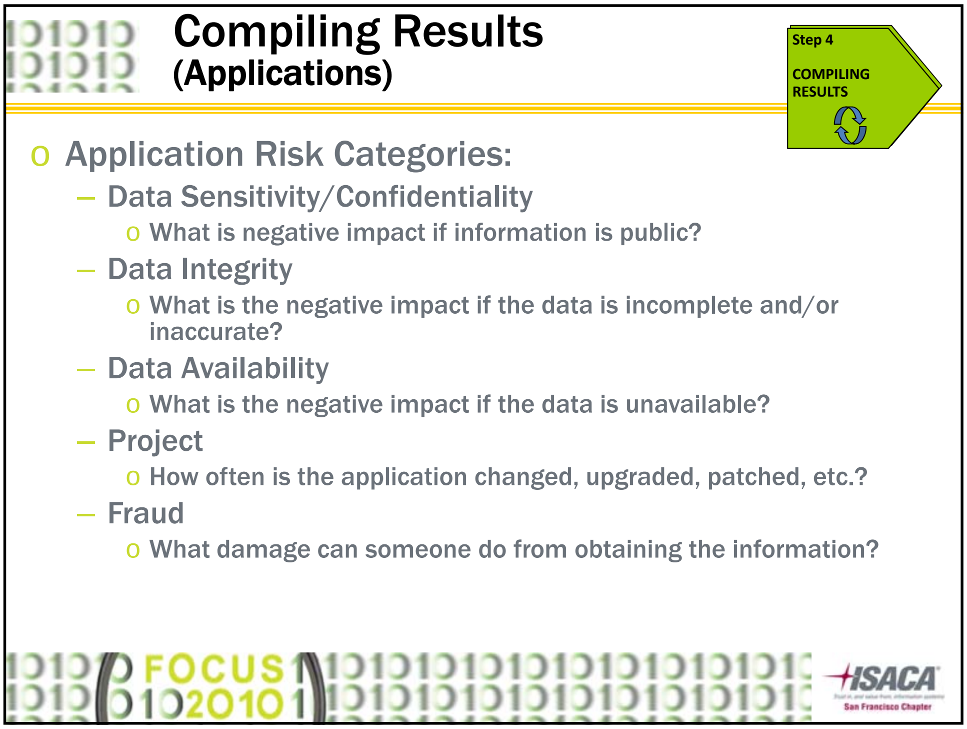


Compiling Results
(Applications)

Step 4

COMPILING RESULTS

- Volume of Data
  - 25 departments
  - 467 applications
  - 2 risk categories
    - Inherent
    - Residual
- 5 Application Risk Types (see next slide)

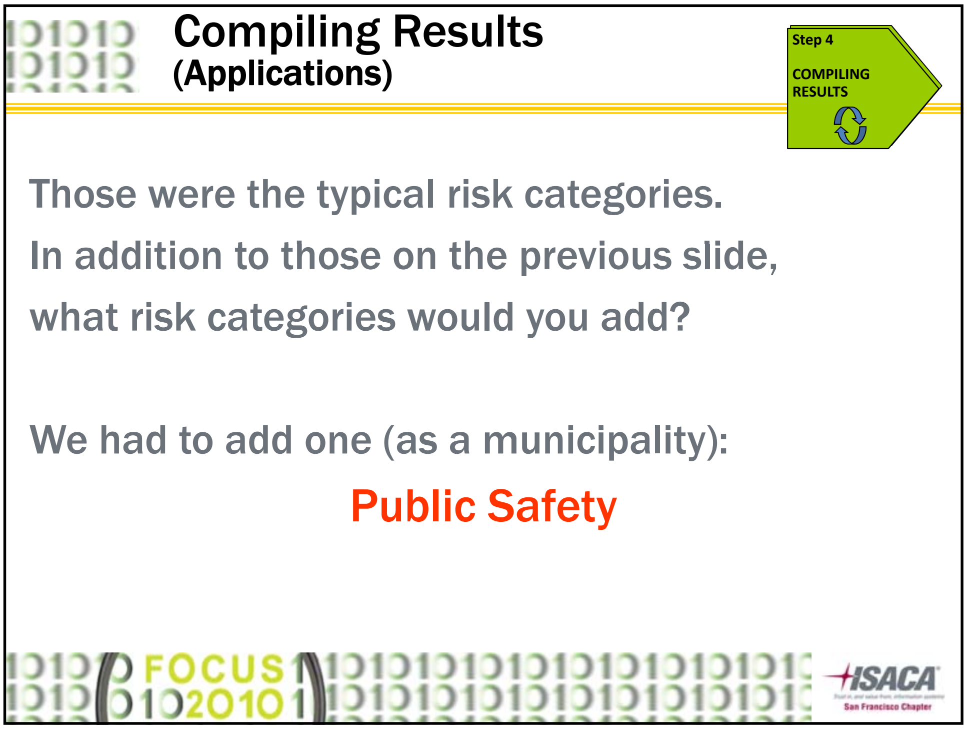


Compiling Results
(Applications)

Step 4

COMPILING RESULTS

- Application Risk Categories:
  - Data Sensitivity/Confidentiality
    - What is negative impact if information is public?
  - Data Integrity
    - What is the negative impact if the data is incomplete and/or inaccurate?
  - Data Availability
    - What is the negative impact if the data is unavailable?
  - Project
    - How often is the application changed, upgraded, patched, etc.?
  - Fraud
    - What damage can someone do from obtaining the information?



Compiling Results
(Applications)

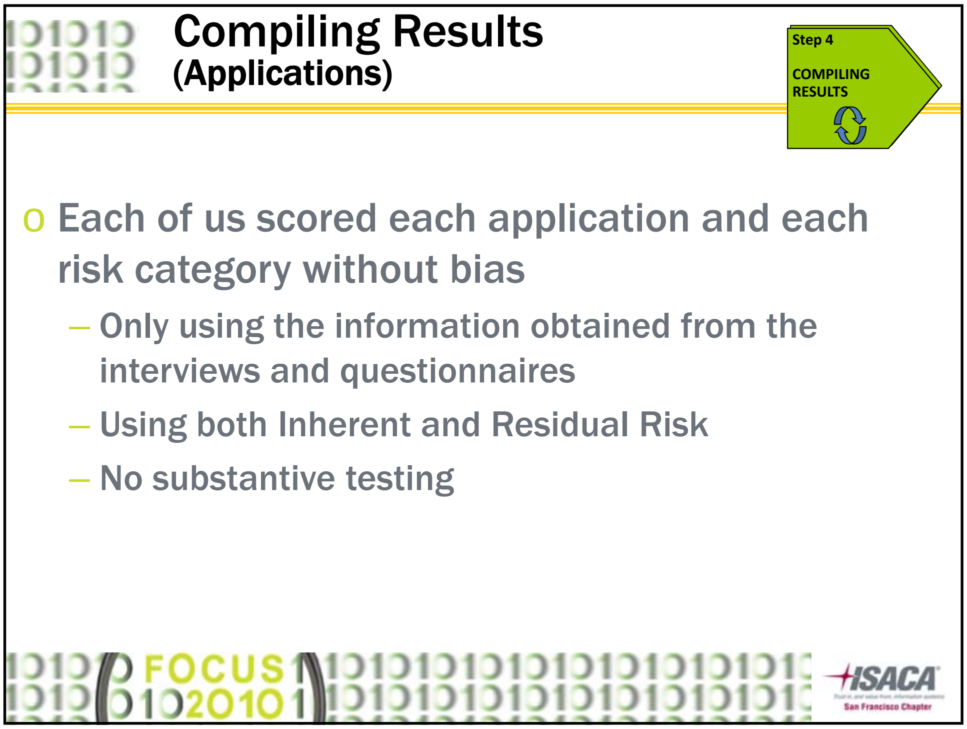
Step 4

COMPILING RESULTS

Those were the typical risk categories.
In addition to those on the previous slide, what risk categories would you add?

We had to add one (as a municipality):

Public Safety



Compiling Results
(Applications)

Step 4

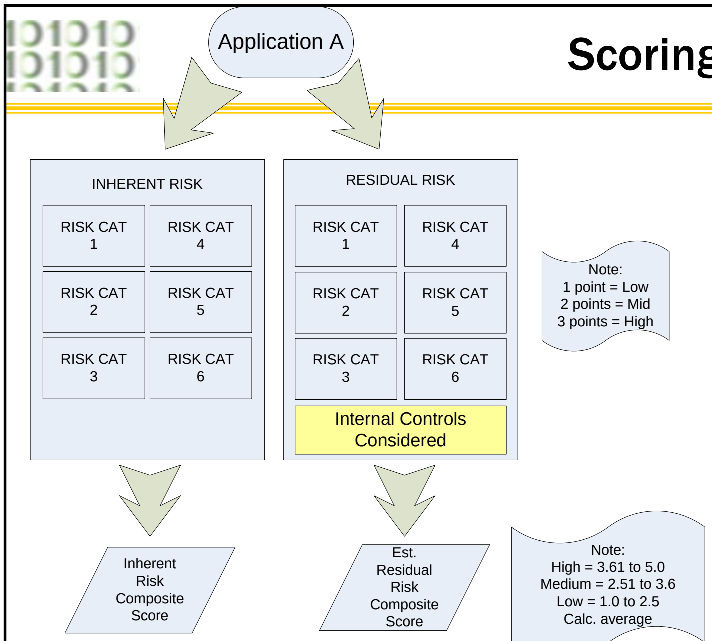
COMPILING RESULTS

- Each of us scored each application and each risk category without bias
  - Only using the information obtained from the interviews and questionnaires
  - Using both Inherent and Residual Risk
  - No substantive testing

Scoring Criteria

Step 4

COMPILING RESULTS



Note:
1 point = Low
2 points = Mid
3 points = High

Note:
High = 3.61 to 5.0
Medium = 2.51 to 3.6
Low = 1.0 to 2.5
Calc. average

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Compiling Results
(Applications)

Step 4

COMPILING RESULTS

We then discussed our individual rankings for each application, and decided on a group consensus ranking.

However, as we analyzed the results, we had to make some adjustments to normalize the results

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Compiling Results
(Applications)

Step 4

COMPILING RESULTS

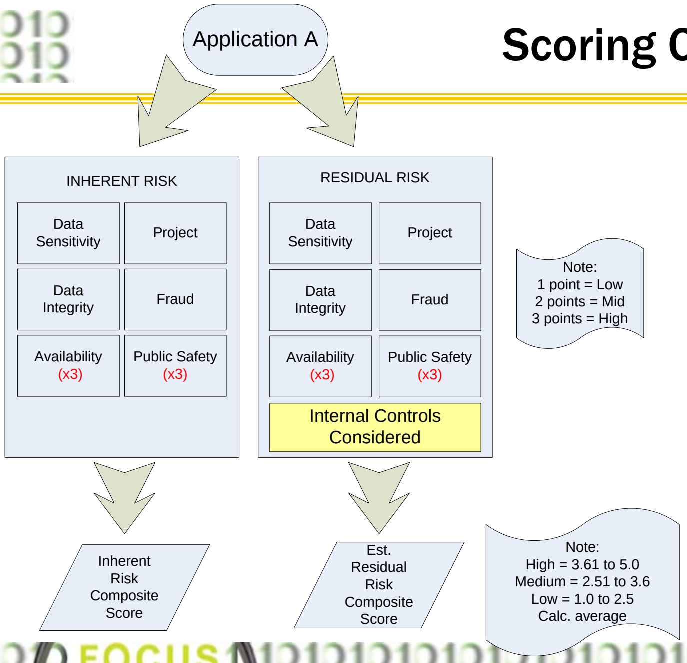
For example:

Initially, our 911 system was ranked as the 45th most critical application

It should be near #1

Thus, we adjusted the scoring criteria to more heavily weight the Public Safety and Data Availability Risk category

Scoring Criteria



Application A

INHERENT RISK

Data Sensitivity	Project
Data Integrity	Fraud
Availability (x3)	Public Safety (x3)

RESIDUAL RISK

Data Sensitivity	Project
Data Integrity	Fraud
Availability (x3)	Public Safety (x3)

Internal Controls Considered

Note:
1 point = Low
2 points = Mid
3 points = High

Inherent Risk Composite Score

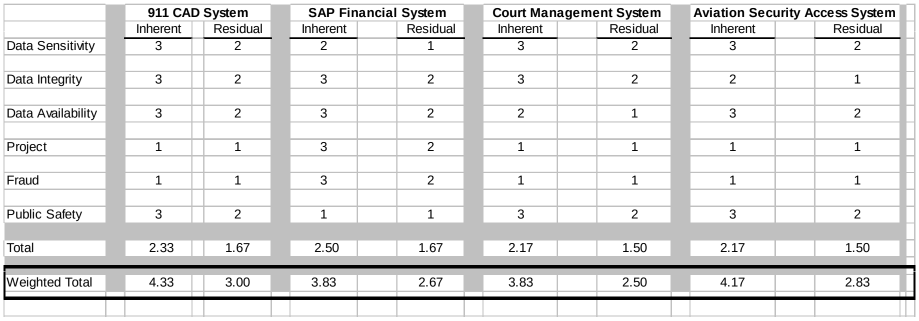
Est. Residual Risk Composite Score

Note:
High = 3.61 to 5.0
Medium = 2.51 to 3.6
Low = 1.0 to 2.5
Calc. average

Compiling Results
(Applications)

Step 4

COMPILING RESULTS



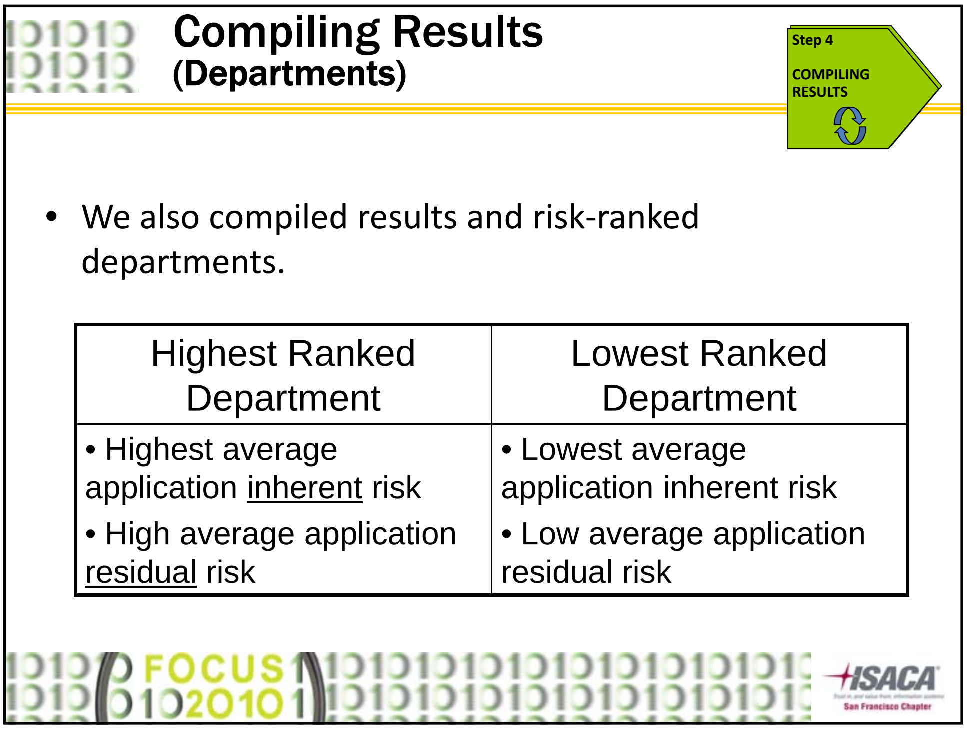
	911 CAD System		SAP Financial System		Court Management System		Aviation Security Access System	
	Inherent	Residual	Inherent	Residual	Inherent	Residual	Inherent	Residual
Data Sensitivity	3	2	2	1	3	2	3	2
Data Integrity	3	2	3	2	3	2	2	1
Data Availability	3	2	3	2	2	1	3	2
Project	1	1	3	2	1	1	1	1
Fraud	1	1	3	2	1	1	1	1
Public Safety	3	2	1	1	3	2	3	2
Total	2.33	1.67	2.50	1.67	2.17	1.50	2.17	1.50
Weighted Total	4.33	3.00	3.83	2.67	3.83	2.50	4.17	2.83

Compiling Results
(Departments)

Step 4

COMPILING RESULTS

- Three primary outputs:
  - Application Risk Summary
  - Department Risk Summary
  - Citywide High Risk Areas



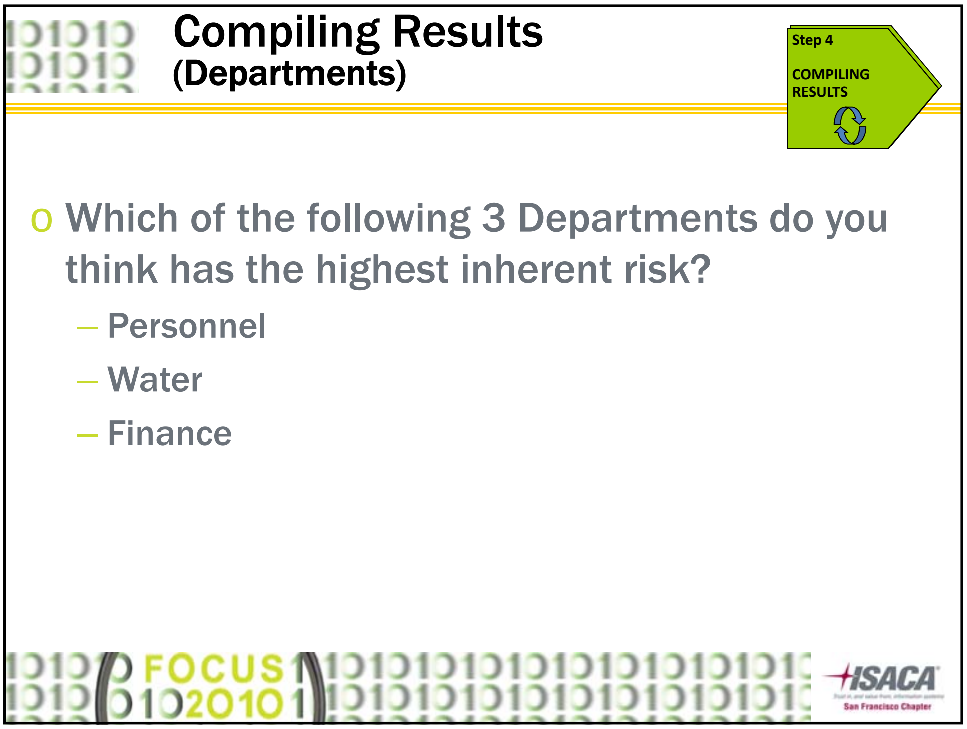
Compiling Results
(Departments)

Step 4

COMPILING RESULTS

- We also compiled results and risk-ranked departments.

Highest Ranked Department	Lowest Ranked Department
• Highest average application inherent risk • High average application residual risk	• Lowest average application inherent risk • Low average application residual risk

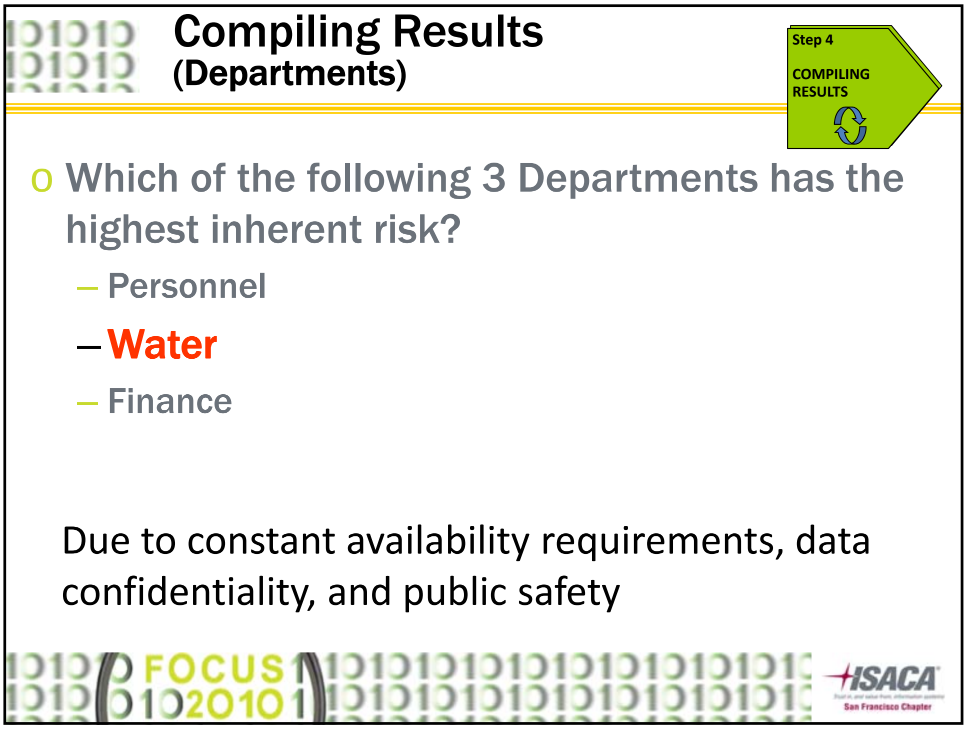


Compiling Results
(Departments)

Step 4

COMPILING RESULTS

- Which of the following 3 Departments do you think has the highest inherent risk?
  - Personnel
  - Water
  - Finance



Compiling Results
(Departments)

Step 4

COMPILING RESULTS

- Which of the following 3 Departments has the highest inherent risk?
  - Personnel
  - **Water**
  - Finance

Due to constant availability requirements, data confidentiality, and public safety

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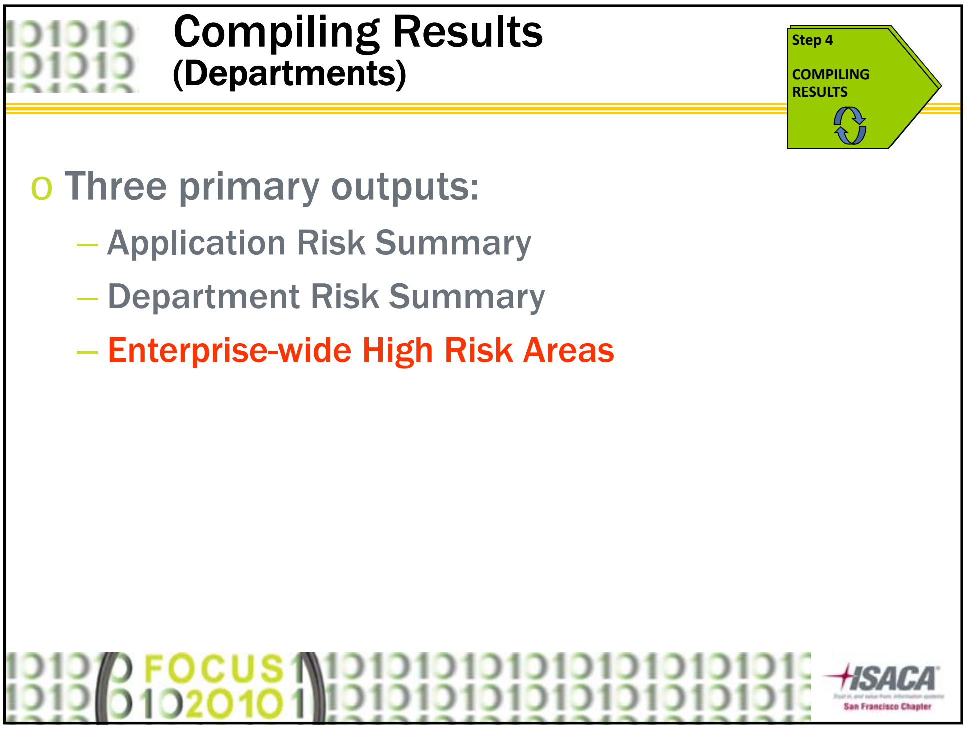

Compiling Results
(Departments)

Step 4

COMPILING RESULTS

- Three primary outputs:
  - Application Risk Summary
  - Department Risk Summary
  - Enterprise-wide High Risk Areas

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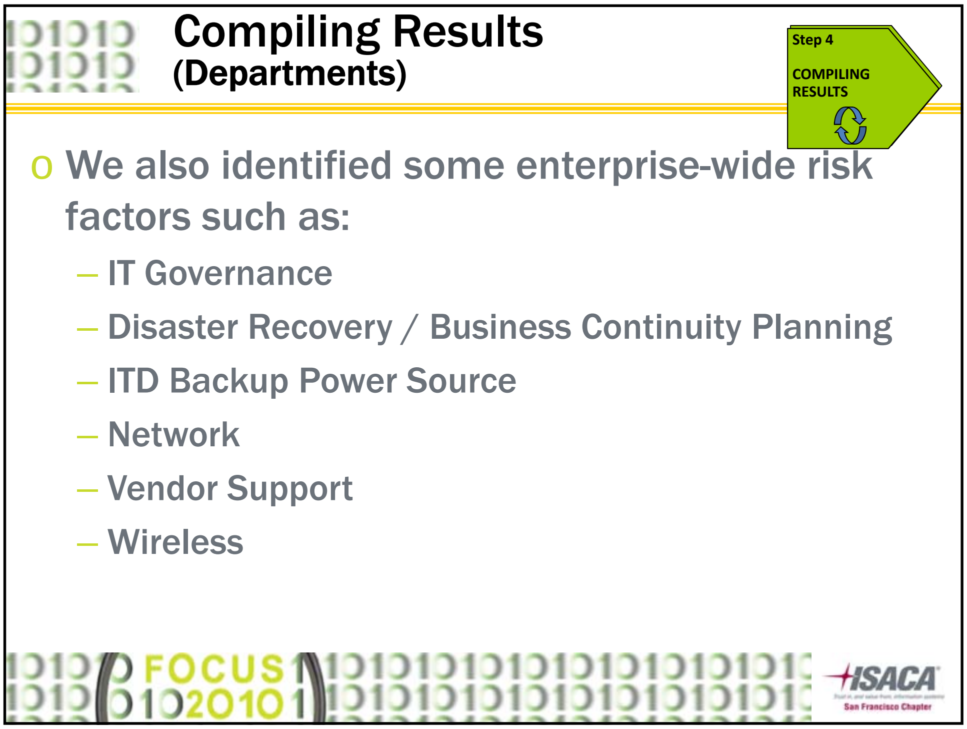

Compiling Results (Departments)

Step 4

COMPILING RESULTS

- We also identified some enterprise-wide risk factors such as:
  - IT Governance
  - Disaster Recovery / Business Continuity Planning
  - ITD Backup Power Source
  - Network
  - Vendor Support
  - Wireless

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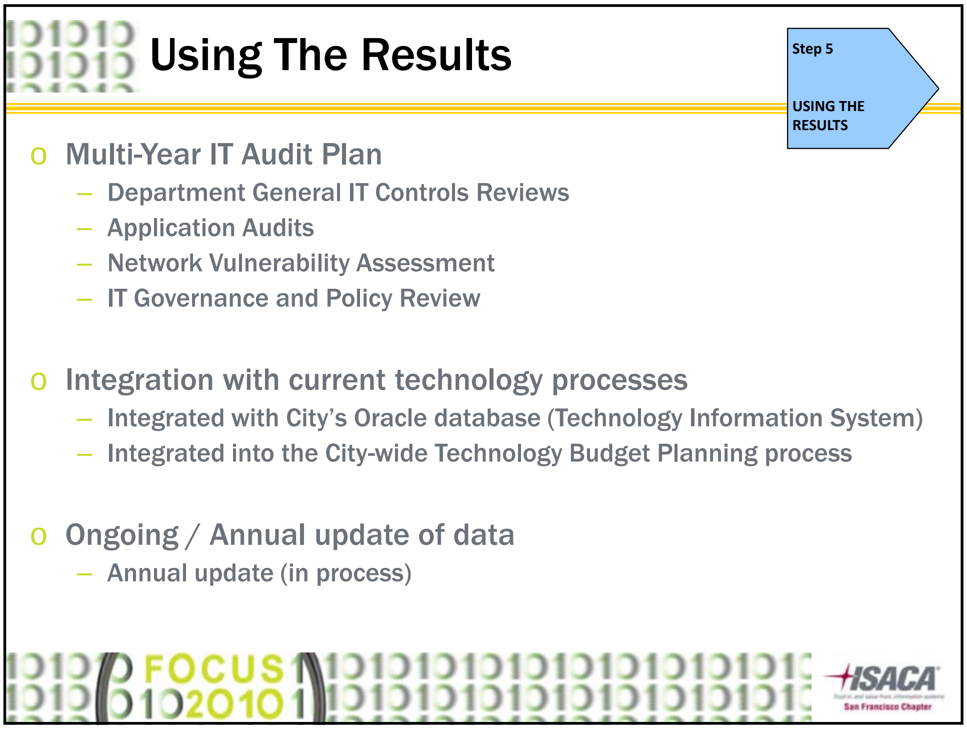
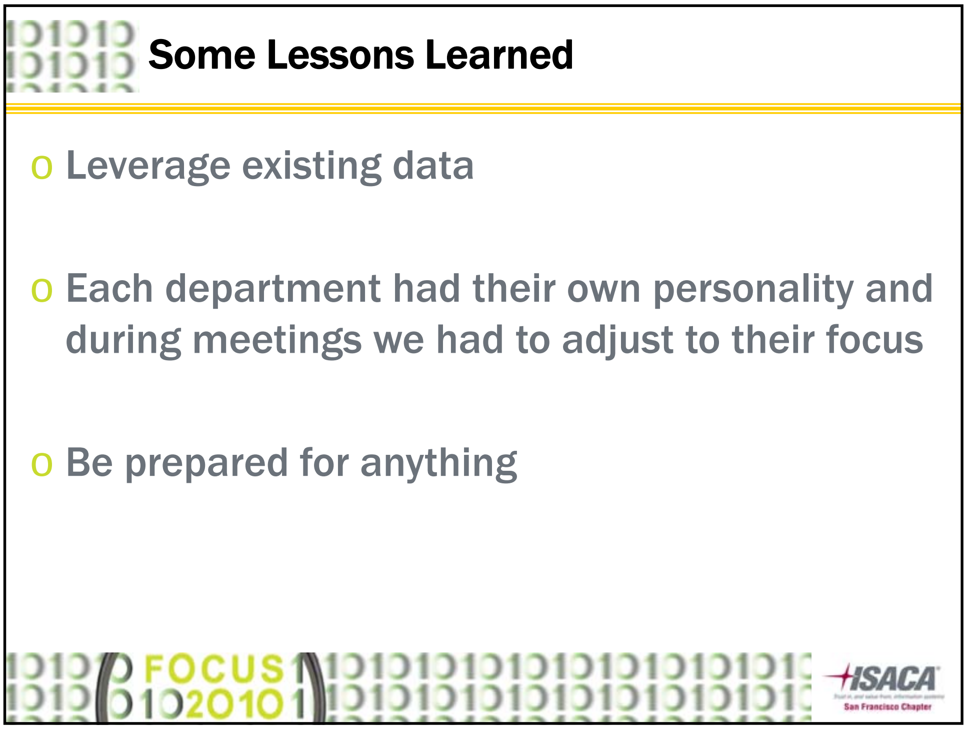


Using The Results

Step 5

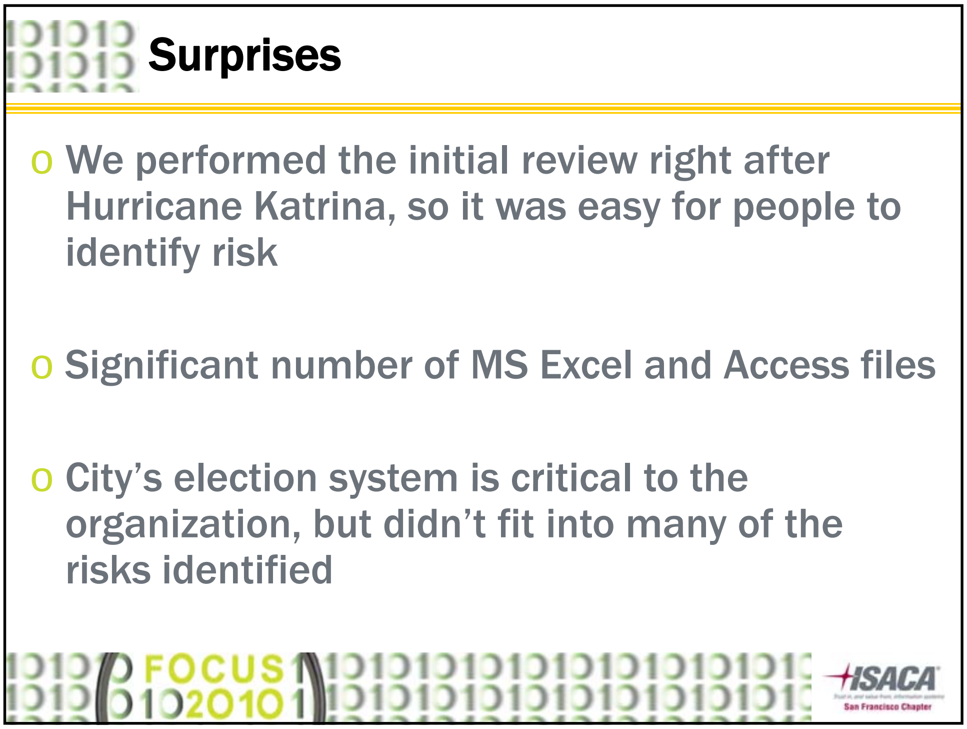
USING THE RESULTS

- Multi-Year IT Audit Plan
  - Department General IT Controls Reviews
  - Application Audits
  - Network Vulnerability Assessment
  - IT Governance and Policy Review
- Integration with current technology processes
  - Integrated with City's Oracle database (Technology Information System)
  - Integrated into the City-wide Technology Budget Planning process
- Ongoing / Annual update of data
  - Annual update (in process)



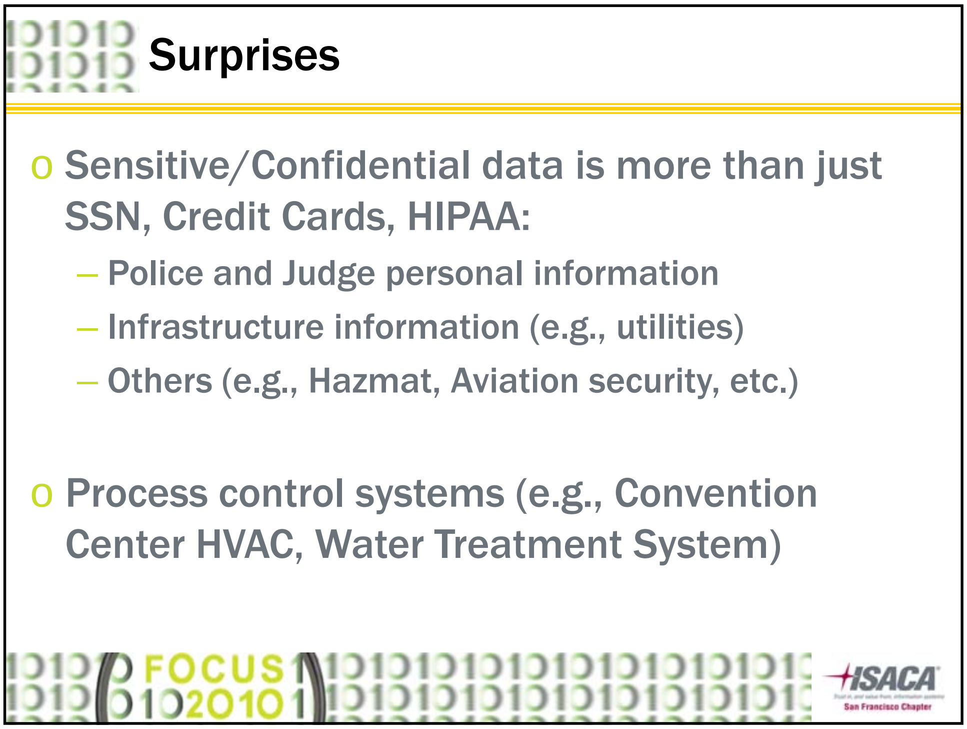
Some Lessons Learned

- Leverage existing data
- Each department had their own personality and during meetings we had to adjust to their focus
- Be prepared for anything



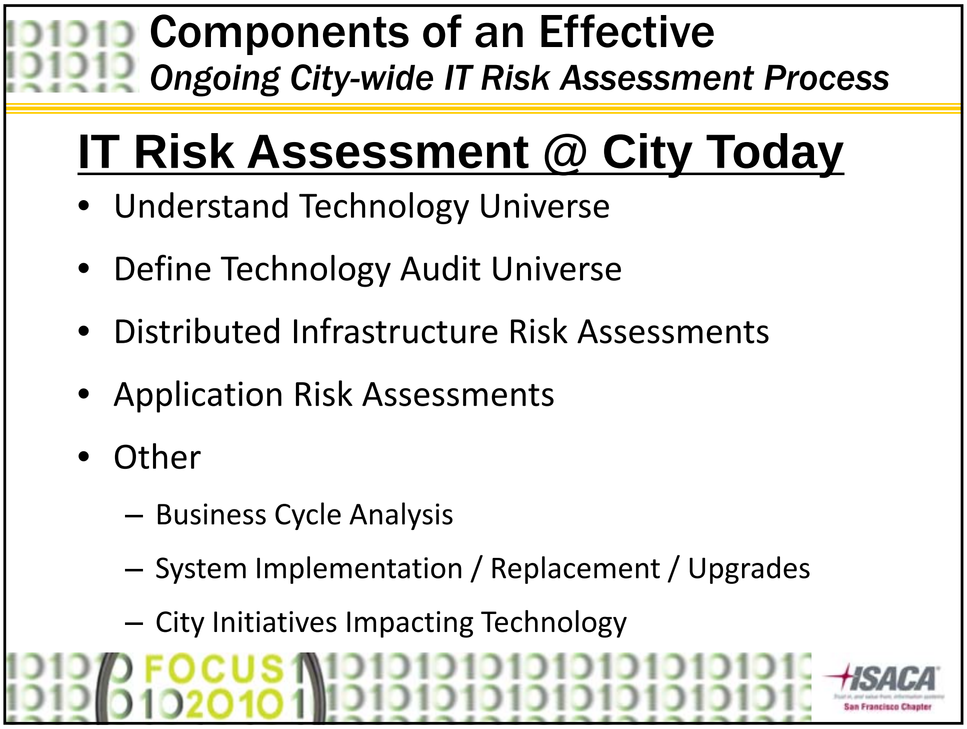
Surprises

- We performed the initial review right after Hurricane Katrina, so it was easy for people to identify risk
- Significant number of MS Excel and Access files
- City’s election system is critical to the organization, but didn’t fit into many of the risks identified



Surprises

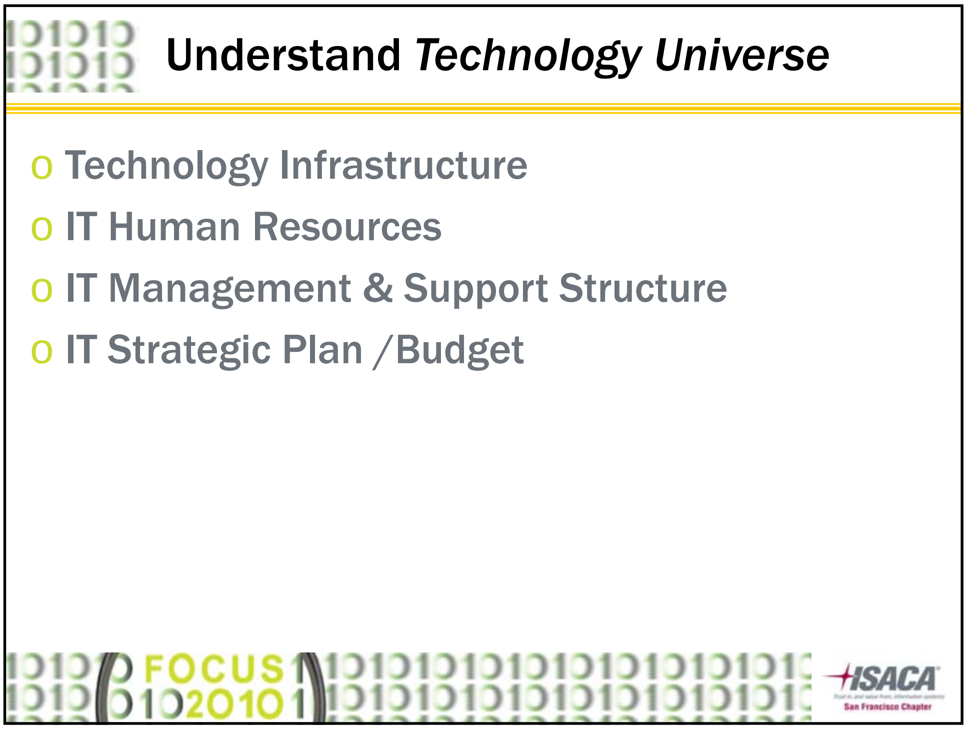
- Sensitive/Confidential data is more than just SSN, Credit Cards, HIPAA:
  - Police and Judge personal information
  - Infrastructure information (e.g., utilities)
  - Others (e.g., Hazmat, Aviation security, etc.)
- Process control systems (e.g., Convention Center HVAC, Water Treatment System)



Components of an Effective *Ongoing City-wide IT Risk Assessment Process*

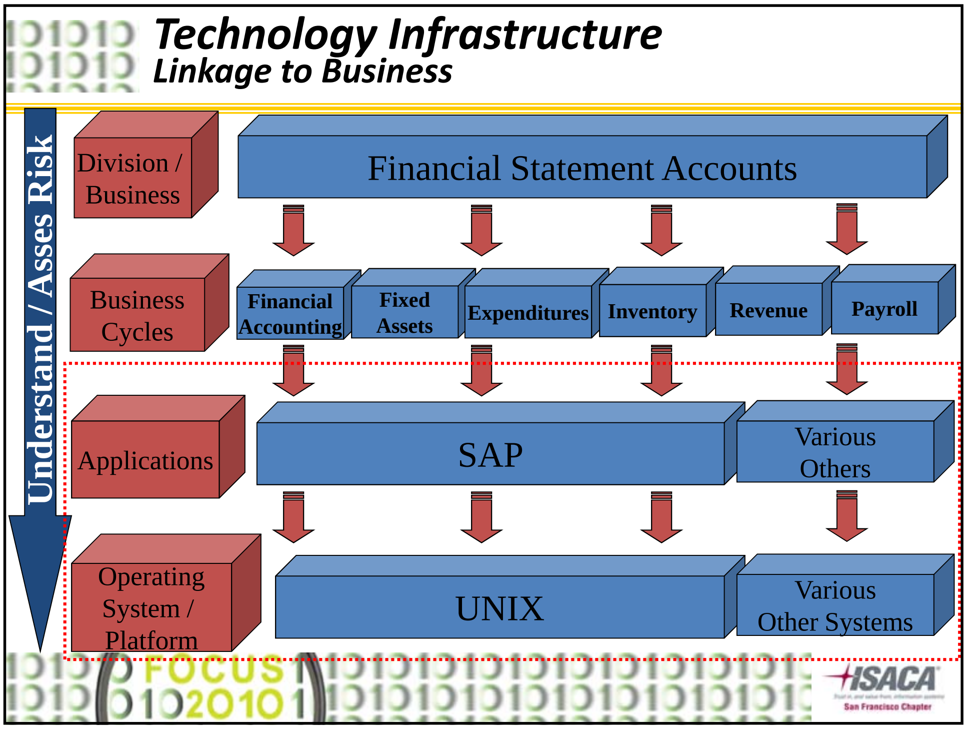
IT Risk Assessment @ City Today

- Understand Technology Universe
- Define Technology Audit Universe
- Distributed Infrastructure Risk Assessments
- Application Risk Assessments
- Other
  - Business Cycle Analysis
  - System Implementation / Replacement / Upgrades
  - City Initiatives Impacting Technology



Understand *Technology Universe*

- Technology Infrastructure
- IT Human Resources
- IT Management & Support Structure
- IT Strategic Plan /Budget



Technology Infrastructure

Linkage to Business

Understand / Asses Risk

Division / Business

Financial Statement Accounts

Business Cycles

Financial Accounting

Fixed Assets

Expenditures

Inventory

Revenue

Payroll

Applications

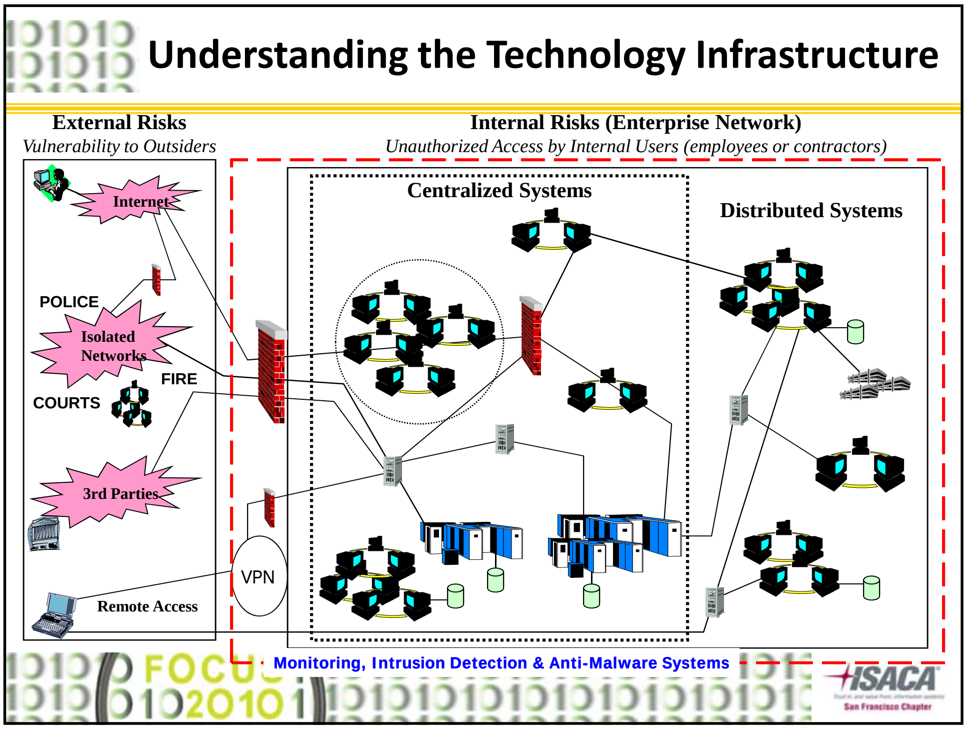
SAP

Various Others

Operating System / Platform

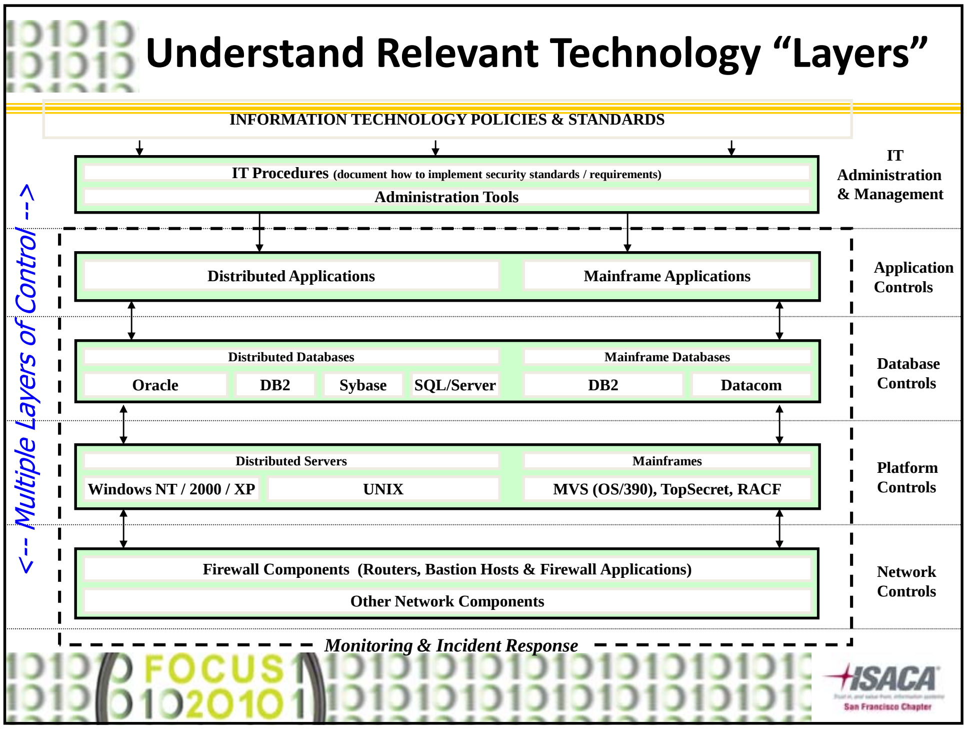
UNIX

Various Other Systems



Understanding the Technology Infrastructure

External Risks
Vulnerability to Outsiders
Internal Risks (Enterprise Network)
Unauthorized Access by Internal Users (employees or contractors)
Internet
POLICE
Isolated Networks
FIRE
COURTS
3rd Parties
Remote Access
VPN
Centralized Systems
Distributed Systems
Monitoring, Intrusion Detection & Anti-Malware Systems
FOCUS
ISACA
San Francisco Chapter



Understand Relevant Technology "Layers"

INFORMATION TECHNOLOGY POLICIES & STANDARDS

IT Procedures (document how to implement security standards / requirements)

Administration Tools

IT Administration & Management

Distributed Applications | Mainframe Applications

Application Controls

Distributed Databases: Oracle, DB2, Sybase, SQL/Server

Mainframe Databases: DB2, Datacom

Database Controls

Distributed Servers: Windows NT / 2000 / XP, UNIX

Mainframes: MVS (OS/390), TopSecret, RACF

Platform Controls

Firewall Components (Routers, Bastion Hosts & Firewall Applications)

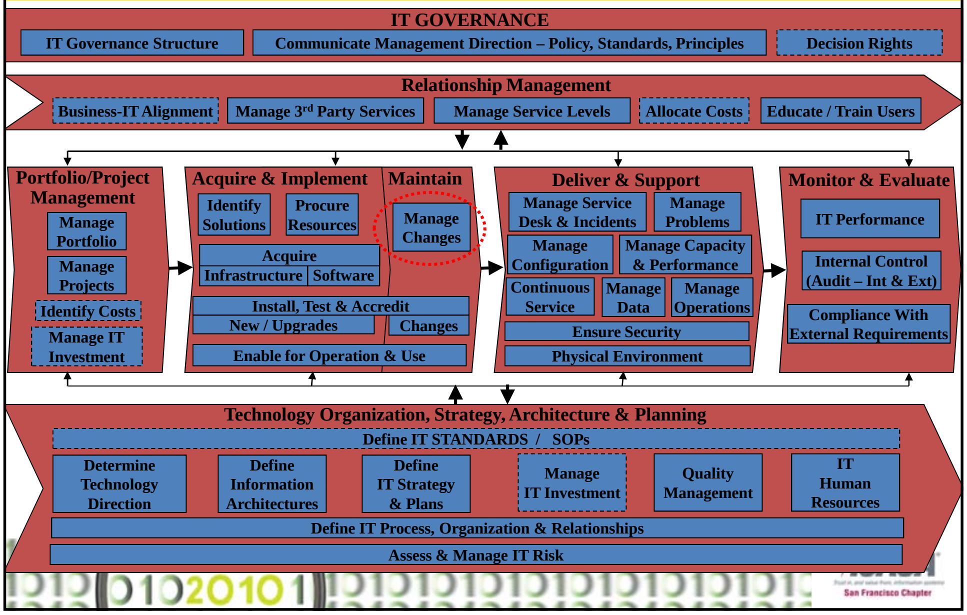
Other Network Components

Network Controls

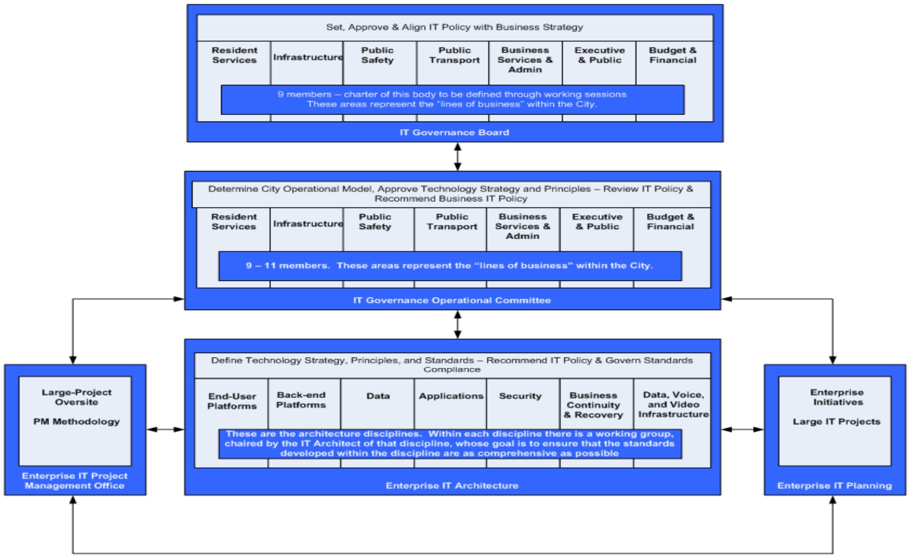
<-- Multiple Layers of Control -->

Monitoring & Incident Response

Understanding the *Process Universe*



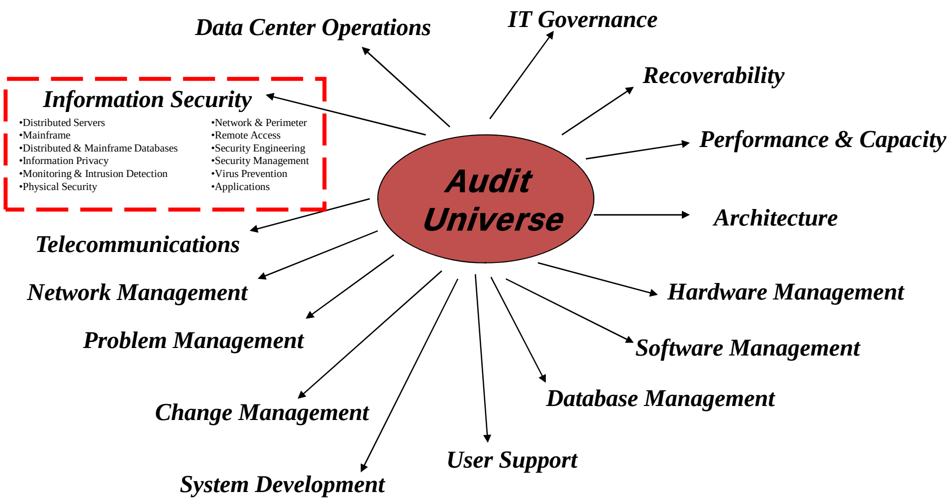
Understanding the IT Governance Structure


Set, Approve & Align IT Policy with Business Strategy
Resident Services
Infrastructure
Public Safety
Public Transport
Business Services & Admin
Executive & Public
Budget & Financial
9 members – charter of this body to be defined through working sessions
These areas represent the "lines of business" within the City.
IT Governance Board
Determine City Operational Model, Approve Technology Strategy and Principles – Review IT Policy & Recommend Business IT Policy
Resident Services
Infrastructure
Public Safety
Public Transport
Business Services & Admin
Executive & Public
Budget & Financial
9 – 11 members. These areas represent the "lines of business" within the City.
IT Governance Operational Committee
Define Technology Strategy, Principles, and Standards – Recommend IT Policy & Govern Standards Compliance
End-User Platforms
Back-end Platforms
Data
Applications
Security
Business Continuity & Recovery
Data, Voice, and Video Infrastructure
These are the architecture disciplines. Within each discipline there is a working group, chaired by the IT Architect of that discipline, whose goal is to ensure that the standards developed within the discipline are as comprehensive as possible
Enterprise IT Architecture
Large-Project Oversite
PM Methodology
Enterprise IT Project Management Office
Enterprise Initiatives
Large IT Projects
Enterprise IT Planning

Understand *Technology AUDIT Universe*

- IT Platforms
- Applications
- Data / Computer Centers
- Information / Data (Classification)

Defining the *Technology Audit Universe*



Audit Universe

Data Center Operations

IT Governance

Recoverability

Performance & Capacity

Architecture

Hardware Management

Software Management

Database Management

User Support

System Development

Change Management

Problem Management

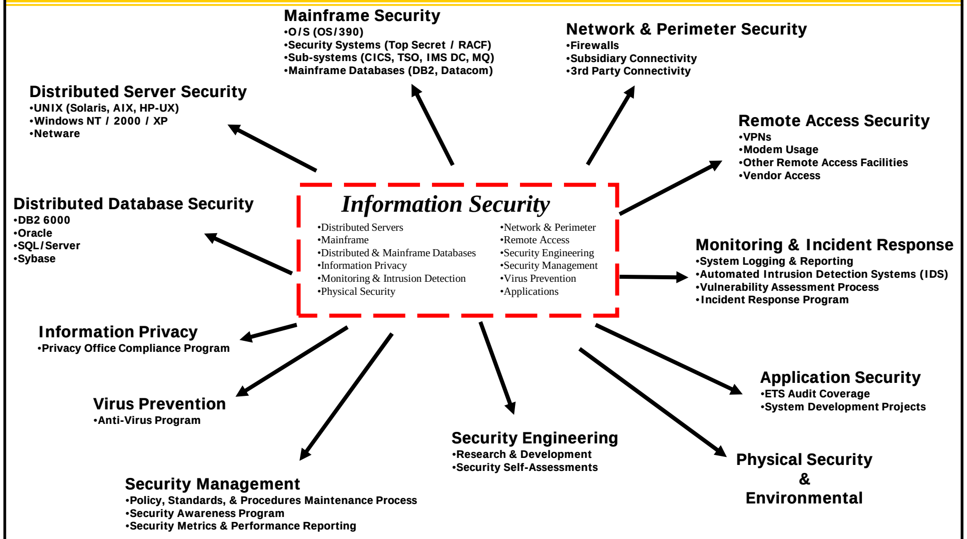
Network Management

Telecommunications

Information Security

- Distributed Servers
- Mainframe
- Distributed & Mainframe Databases
- Information Privacy
- Monitoring & Intrusion Detection
- Physical Security
- Network & Perimeter
- Remote Access
- Security Engineering
- Security Management
- Virus Prevention
- Applications

Security Audit Universe



Information Security

- •Distributed Servers
- •Mainframe
- •Distributed & Mainframe Databases
- •Information Privacy
- •Monitoring & Intrusion Detection
- •Physical Security
- •Network & Perimeter
- •Remote Access
- •Security Engineering
- •Security Management
- •Virus Prevention
- •Applications

Mainframe Security
- •O/S (OS/390)
- •Security Systems (Top Secret / RACF)
- •Sub-systems (CICS, TSO, IMS DC, MQ)
- •Mainframe Databases (DB2, Datacom)

Network & Perimeter Security
- •Firewalls
- •Subsidiary Connectivity
- •3rd Party Connectivity

Distributed Server Security
- •UNIX (Solaris, AIX, HP-UX)
- •Windows NT / 2000 / XP
- •Netware

Remote Access Security
- •VPNs
- •Modem Usage
- •Other Remote Access Facilities
- •Vendor Access

Distributed Database Security
- •DB2 6000
- •Oracle
- •SQL/Server
- •Sybase

Monitoring & Incident Response
- •System Logging & Reporting
- •Automated Intrusion Detection Systems (IDS)
- •Vulnerability Assessment Process
- •Incident Response Program

Information Privacy
- •Privacy Office Compliance Program

Application Security
- •ETS Audit Coverage
- •System Development Projects

Virus Prevention
- •Anti-Virus Program

Security Engineering
- •Research & Development
- •Security Self-Assessments

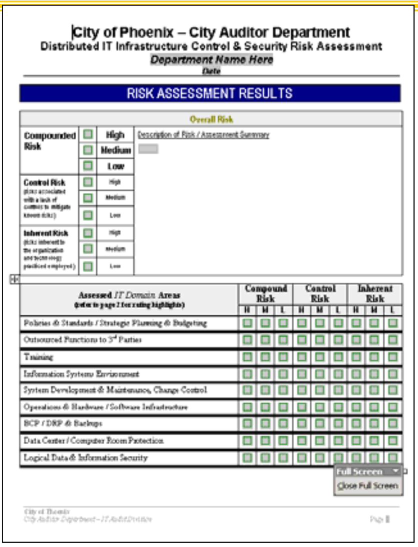
Physical Security & Environmental

Security Management
- •Policy, Standards, & Procedures Maintenance Process
- •Security Awareness Program
- •Security Metrics & Performance Reporting

Distributed IT Infrastructure
Security & Control Risk Assessments

Focus

IT General Controls



City of Phoenix – City Auditor Department
Distributed IT Infrastructure Control & Security Risk Assessment
Department Name Here
Date

RISK ASSESSMENT RESULTS

Overall Risk			
Compounded Risk	□	High	Description of Risk / Assessment Summary
	□	Medium	
	□	Low	
Control Risk (risks associated with a lack of controls to mitigate known risks)	□	High	
	□	Medium	
	□	Low	
Inherent Risk (risks inherent to the organization and technology practices employed)	□	High	
	□	Medium	
	□	Low	

Assessed *IT Domain* Areas (refer to page 2 for rating highlights)	Compound Risk			Control Risk			Inherent Risk		
	H	M	L	H	M	L	H	M	L
Policies & Standards / Strategic Planning & Budgeting	□	□	□	□	□	□	□	□	□
Outsourced Functions to 3rd Parties	□	□	□	□	□	□	□	□	□
Training	□	□	□	□	□	□	□	□	□
Information Systems Environment	□	□	□	□	□	□	□	□	□
System Development & Maintenance, Change Control	□	□	□	□	□	□	□	□	□
Operations & Hardware / Software Infrastructure	□	□	□	□	□	□	□	□	□
BCP / DRP & Backups	□	□	□	□	□	□	□	□	□
Data Center / Computer Room Protection	□	□	□	□	□	□	□	□	□
Logical Data & Information Security	□	□	□	□	□	□	□	□	□

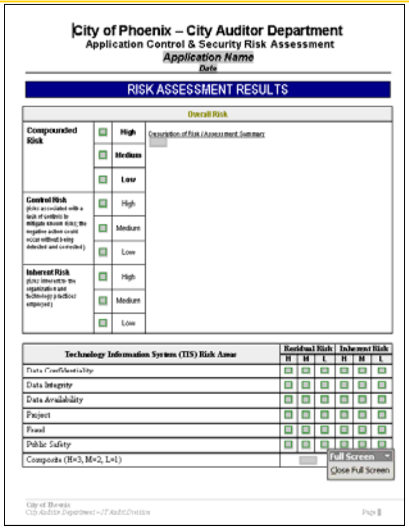
City of Phoenix
City Auditor Department – IT Audit Division
Page 1

Applications

Security & Control Risk Assessments

Focus

Application Controls



City of Phoenix – City Auditor Department
Application Control & Security Risk Assessment
Application Name
Date

RISK ASSESSMENT RESULTS

Overall Risk			
Compounded Risk	□	**High**	Description of Risk / Assessment Summary
	□	**Medium**	
	□	**Low**	
Control Risk (risks associated with a lack of controls to mitigate known risks; the negative action could occur without being detected and corrected)	□	High	
	□	Medium	
	□	Low	
Inherent Risk (risks inherent to the organization and technology practices employed)	□	High	
	□	Medium	
	□	Low	

Technology Information System (TIS) Risk Areas	Residual Risk			Inherent Risk		
	H	M	L	H	M	L
Data Confidentiality	□	□	□	□	□	□
Data Integrity	□	□	□	□	□	□
Data Availability	□	□	□	□	□	□
Project	□	□	□	□	□	□
Fraud	□	□	□	□	□	□
Public Safety	□	□	□	□	□	□
Composite (H=3, M=2, L=1)						

City of Phoenix
City Auditor Department – IT Audit Division

Page 1

Technology Specific

Security & Control Risk Assessments

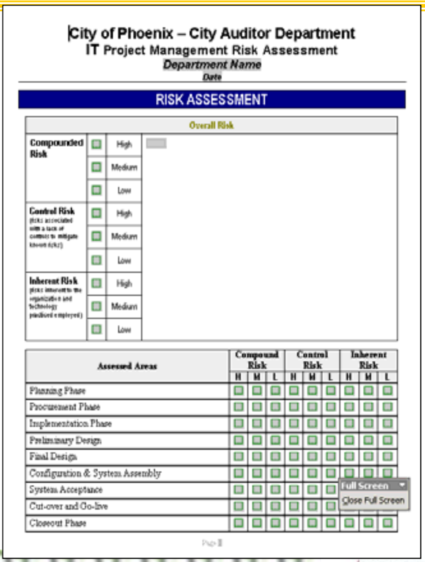
Examples:

-OS Config & Patch Mgt

-IT Project Management

-Privacy

-Information Security



City of Phoenix – City Auditor Department
IT Project Management Risk Assessment
Department Name
Date

RISK ASSESSMENT

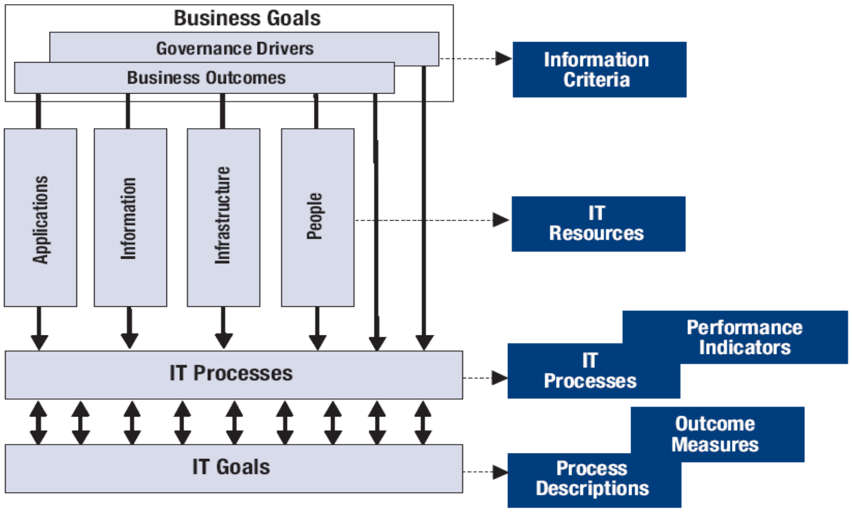
Overall Risk			
Compounded Risk	□	High	
	□	Medium	
	□	Low	
Control Risk (risks associated with a lack of controls to mitigate known risks)	□	High	
	□	Medium	
	□	Low	
Inherent Risk (risks inherent to the organization and technology practices employed)	□	High	
	□	Medium	
	□	Low	

Assessed Areas	Compound Risk			Control Risk			Inherent Risk		
	H	M	L	H	M	L	H	M	L
Planning Phase	□	□	□	□	□	□	□	□	□
Procurement Phase	□	□	□	□	□	□	□	□	□
Implementation Phase	□	□	□	□	□	□	□	□	□
Preliminary Design	□	□	□	□	□	□	□	□	□
Final Design	□	□	□	□	□	□	□	□	□
Configuration & System Assembly	□	□	□	□	□	□	□	□	□
System Acceptance	□	□	□	□	□	□			
Cut-over and Go-live	□	□	□	□	□	□			
Closeout Phase	□	□	□	□	□	□	□	□	□

Page 1

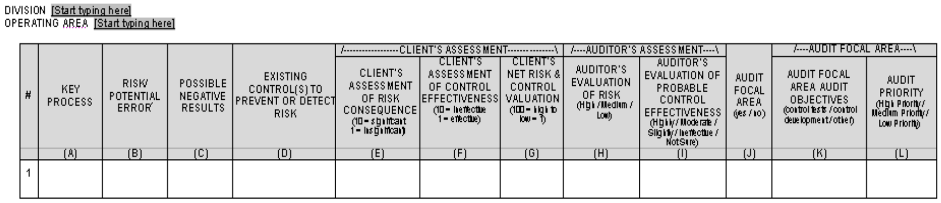
IT Governance (Business Goals Drive IT Goals)

Business Cycle Analysis & Risk Assessment



IT Governance (Business Goals Drive IT Goals)

Business Cycle Analysis & Risk Assessment

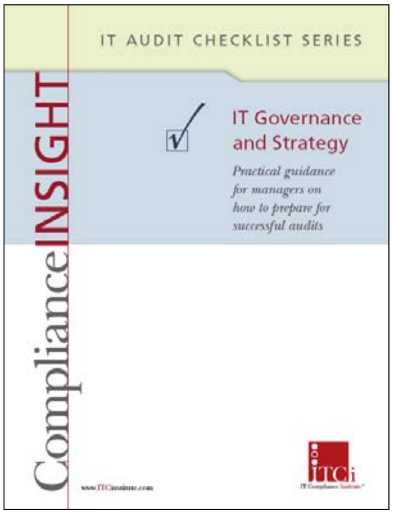


DIVISION [Start typing here]
OPERATING AREA [Start typing here]

#	KEY PROCESS	RISK/ POTENTIAL ERROR	POSSIBLE NEGATIVE RESULTS	EXISTING CONTROL(S) TO PREVENT OR DETECT RISK	/-----------------CLIENT'S ASSESSMENT---------------\			/----AUDITOR'S ASSESSMENT----\		AUDIT FOCAL AREA (yes / no)	/----AUDIT FOCAL AREA----\	
					CLIENT'S ASSESSMENT OF RISK CONSEQUENCE (10 = significant 1 = insignificant)	CLIENT'S ASSESSMENT OF CONTROL EFFECTIVENESS (10 = ineffective 1 = effective)	CLIENT'S NET RISK & CONTROL VALUATION (100 = high to low = 1)	AUDITOR'S EVALUATION OF RISK (High /Medium / Low)	AUDITOR'S EVALUATION OF PROBABLE CONTROL EFFECTIVENESS (Highly / Moderate / Slightly / Ineffective / Not Sure)		AUDIT FOCAL AREA AUDIT OBJECTIVES (control tests / control development / other)	AUDIT PRIORITY (High Priority / Medium Priority / Low Priority)
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)
1												

Resources

IT Compliance Institute



IT AUDIT CHECKLIST SERIES

Compliance INSIGHT

IT Governance and Strategy

Practical guidance for managers on how to prepare for successful audits

www.ITCinstitute.com

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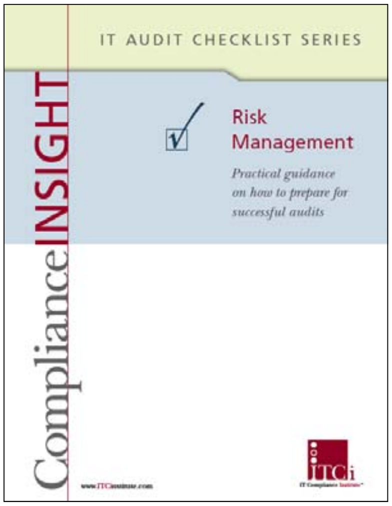

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Questions?

Thank You!

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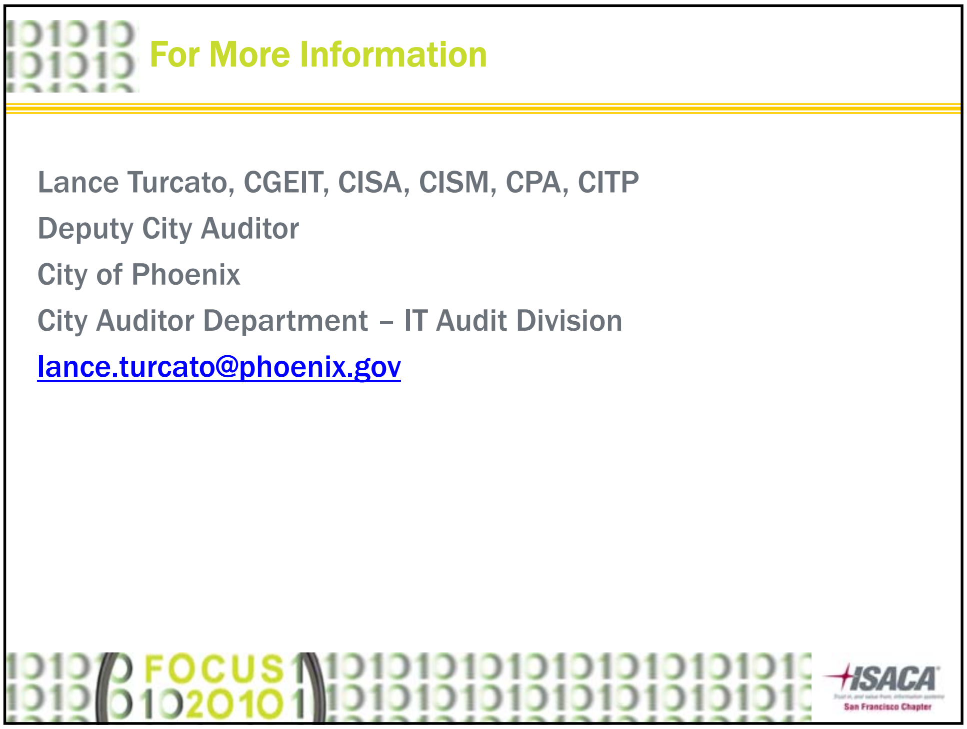

For More Information

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