

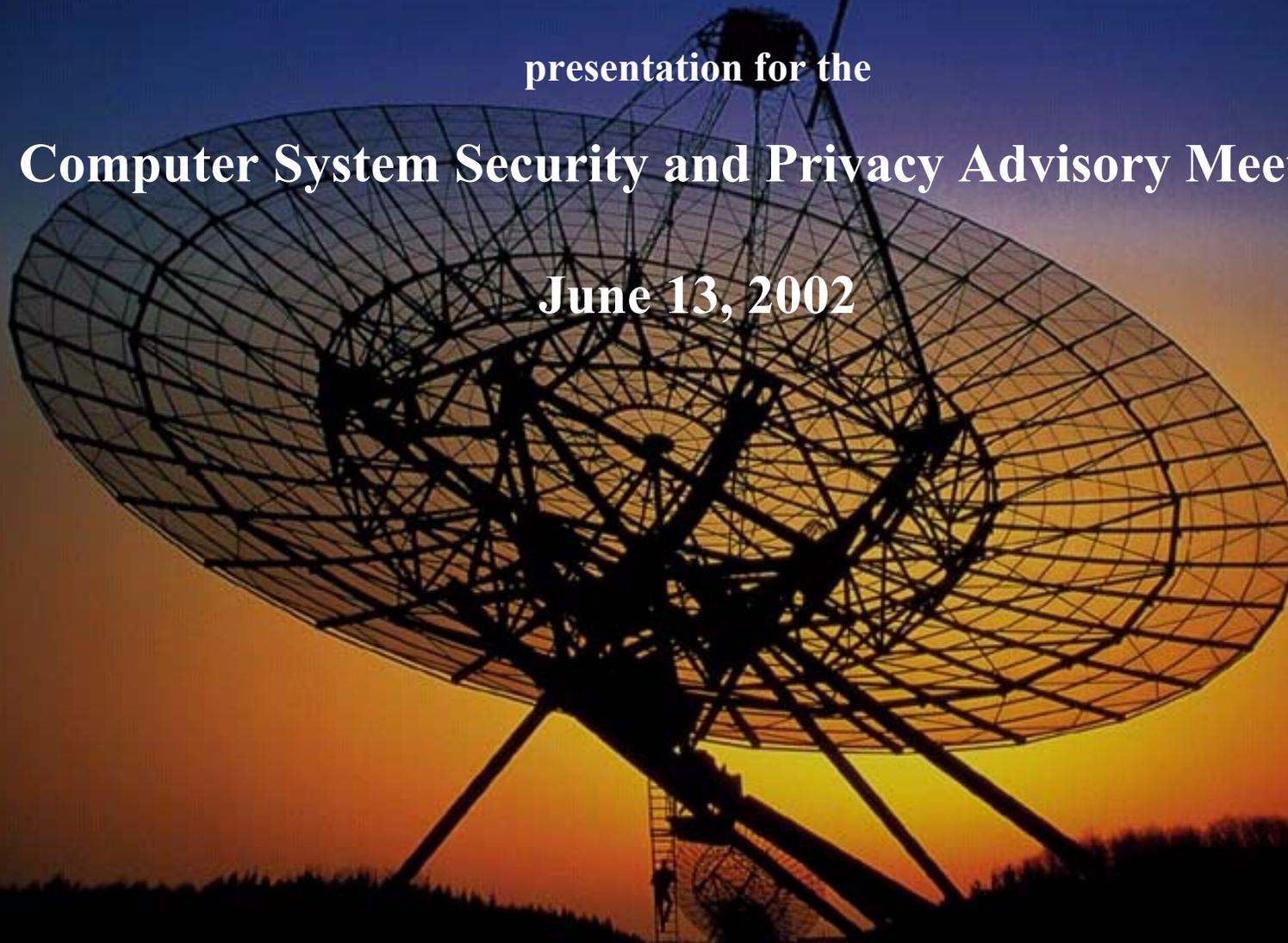
Information Assurance/Information Security

John W. Lainhart IV

presentation for the

Computer System Security and Privacy Advisory Meeting

June 13, 2002



Agenda

- Information Assurance
- COBIT™ & the Management Guidelines
- IT Governance
- SysTrustSM Assurance Service
- Managing Security of Information
- Board Briefing on IT Governance
- Information Security Governance
- Center for Internet Security Benchmarks

Information Assurance

Information Assurance

Conducting those operations that protect and defend information and information systems by ensuring confidentiality, integrity, availability and accountability. This includes providing for restoration of information systems by incorporating protection, detection and reaction capabilities.

NIAP Definition

Strategic Vision: Holistic Understanding

Security is a Function of Business



Successful Implementation of Any Sensitive Security Program Requires An Understanding of the Mission, Operations, Resources, and the Business Impact Caused by Vulnerabilities

Implement Control Protective Measures to Mitigate Exploitable Risks and Minimize Operational Impacts Caused by Physical And IT Vulnerabilities...

Threats Will Continue to Exist...

Traditional Security Must be Integrated And Active for OPSEC and Business Continuity to be Effective

IA: A Functional Spectrum

IA Program Objectives: *Moving Beyond Information Security* Integrity, Confidentiality, Availability, Accountability

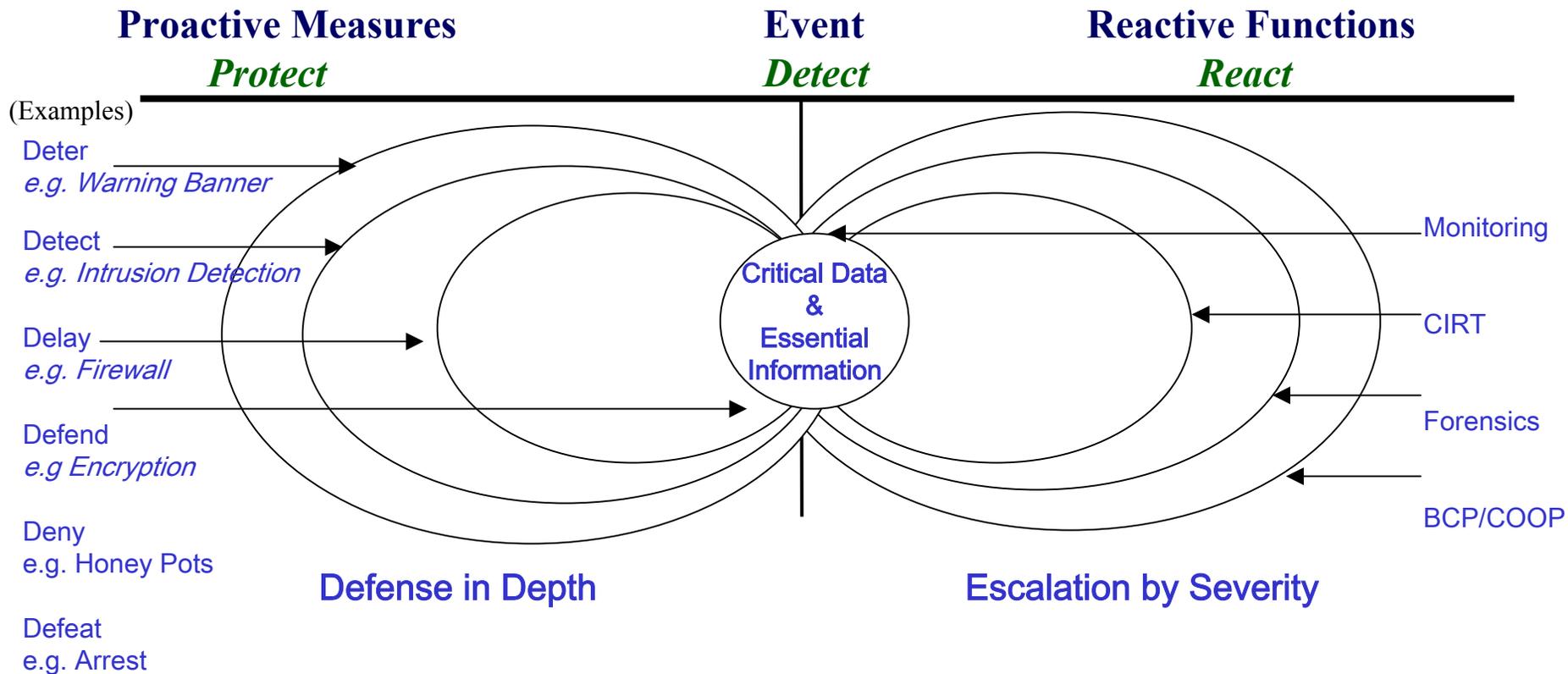
Proactive Measures <i>Protect</i>	Event <i>Detect</i>	Reactive Functions <i>React</i>
(Examples)		
Policies	Procedures	CIRT (CERT)
Intrusion Detection	Firewall Management	COOP
Password Management	Configuration	Disaster Recovery
Biometrics	Management	Continuity of Government
Encryption	Threat Analysis	Incident Reporting Process
Vulnerability Assessment	Risk Analysis	Investigations
Training & Education	Document Control	Computer Forensics
Classification	Smart Cards	Business Continuity
Management	C&A (NIACAP, DITSCAP)	Network Scty Intell
SW Patches	Anti-Virus	
Data Storage	Contingency Plans	
Personnel Security	Physical Security	
Counter Competitor Intelligence		
Penetration Testing		
Networks		
Social Engineering		
Open Source Exploitation		

**Business Environment Monitoring
Managed Security Services**

***Successful
programs contain
both
proactive and reactive
functions to be effective.***

Concentric Barriers: Rings of Security

Protecting Critical Assets in the Virtual World Mirrors the Physical



PDD 63

PDD 63 responds to the *Interdependence* of Infrastructures and Technologies

Telecommunications

Power

Gas/Oil

Finance/Banking

Transportation

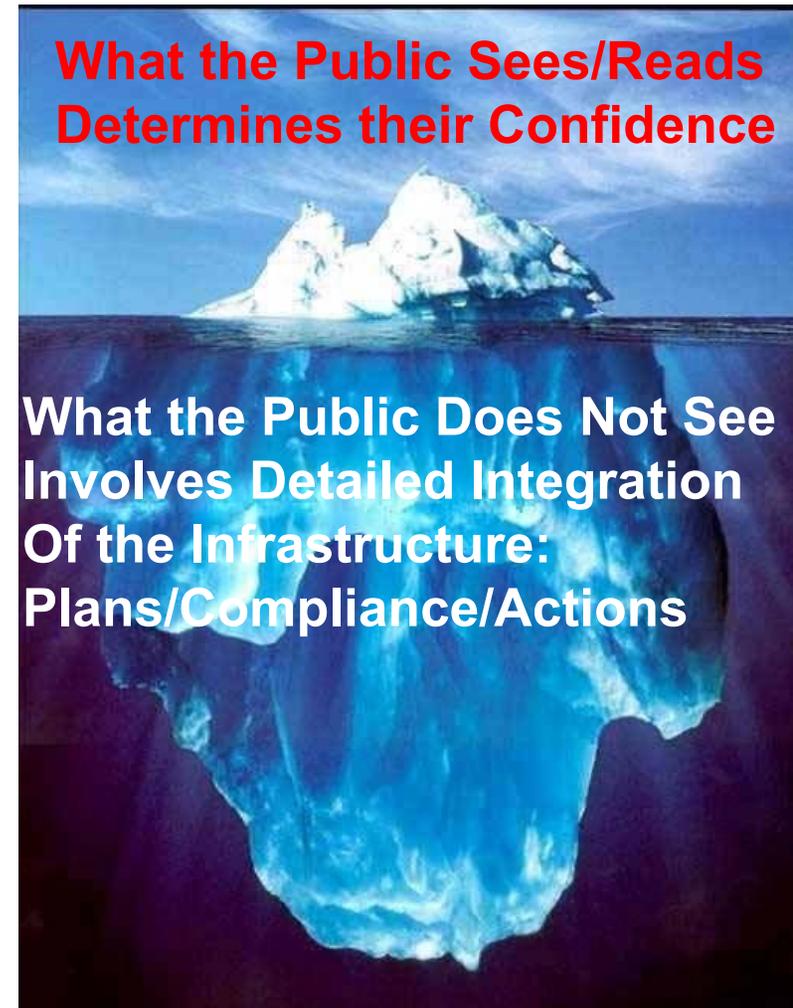
Water

Government Services

Emergency Services

What We Can Do:

- **Threat Analysis**
- **Vulnerability Studies**
- **Protective Measures**
- **Impact Analysis**



Information Assurance Program

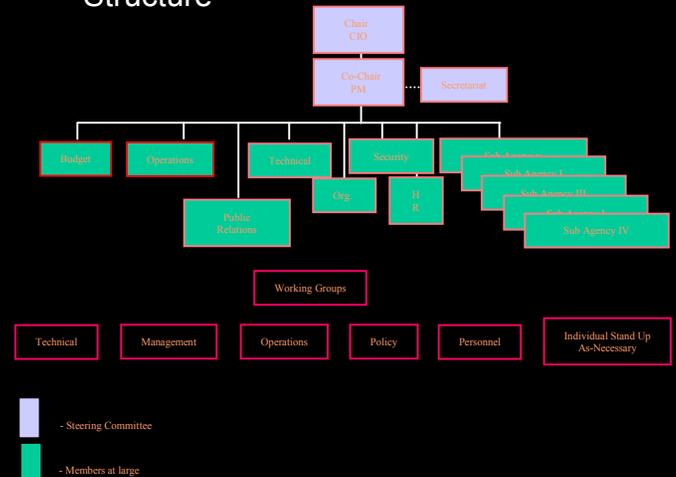


Information Assurance Program

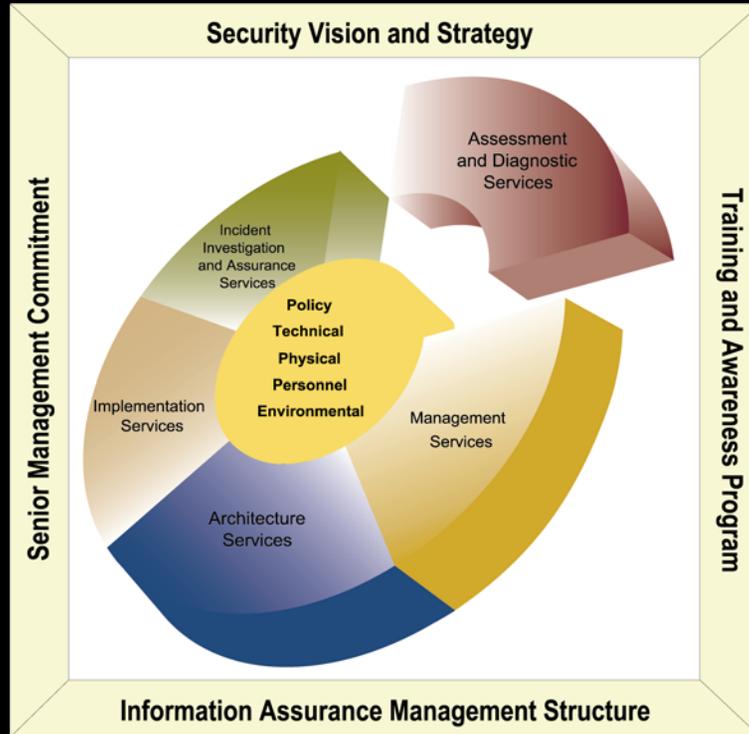
Develop a cross functional (technical, physical, personnel and environmental) matrix team consisting of empowered management and staff who are tasked to develop and manage long-term strategic direction for the organization

Information Assurance Program incorporating:

- Security Vision & Strategy
- Senior Management Commitment
- Training & Awareness Programs
- Information Assurance Management Structure



Information Assurance Program



Assessment and Diagnostic Service

- Risk Assessment (incorporating Asset Inventory, Mission Requirements Driven Policy, Threats, Vulnerabilities, associated Risk, Countermeasures, ROI, and strategic action implementation plan)
- Penetration Testing and Analysis
- Financial (budget) Assessment
- Diagnostics Security Reviews of specific platforms
- Asset Inventory Analysis
- Security Readiness Reviews
- Security Testing and Evaluation (documentation, testing and Evaluation)
- Government Information Security Reform Act (GISRA) Review
- Critical Infrastructure Protection Analysis
- Certification and Accreditation (System Security Authorization Agreement)
- Data/Information Integrity Assessment
- Site Surveys and Analysis
- Tools (i.e., EMM@, ESAS, Buddy System)

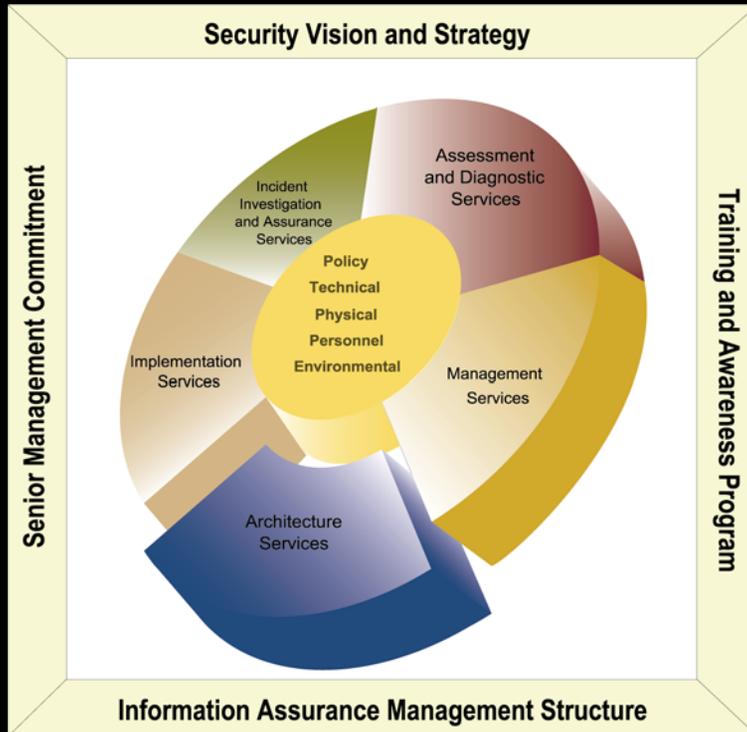
Information Assurance Program



Management Services

- Policy Development
- Technical Writing
- Standards
- Management Infrastructure
- Education Training and Awareness
- Business & Technical Disaster Recovery (documentation, training and testing)
- Management Training
- Continuity Of Operations (COOP) Development
- Capacity Management
- Configuration Management
- IAP Metrics
- Knowledge Management
- Distance Learning
- Strategic Management Consulting
- Economic Security

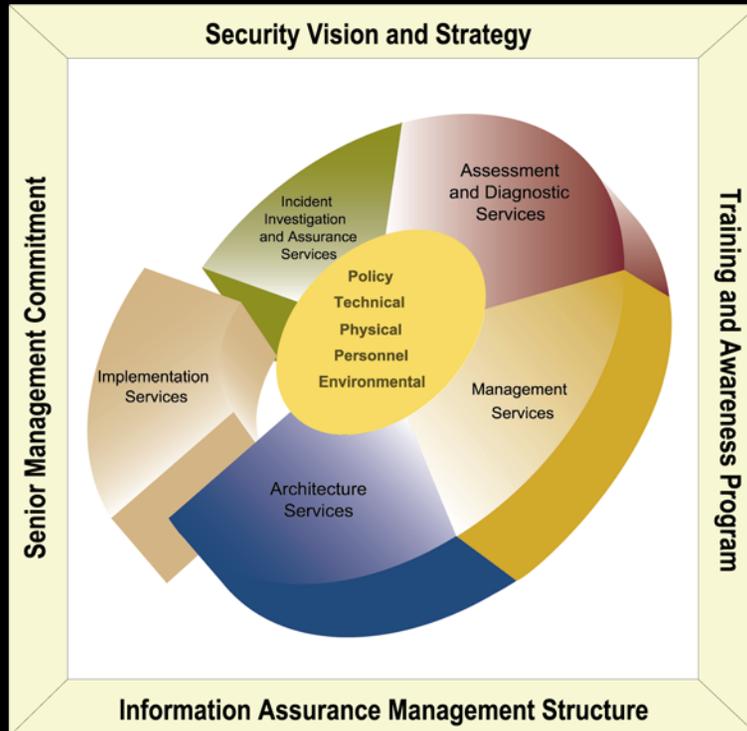
Information Assurance Program



Architecture Services

- Enterprise-Wide Architecture
- Network Security architecture and Specialized Architectures
- Security Product Review & Analysis
- Security Program Review & Analysis
- Life Cycle Methodology Development
- Configuration
- Security Architecture and Design

Information Assurance Program



Implementation Services

- Commercial security products (COTS)
- Encryption
- Single Sign On
- Firewalls
- Servers
- Routers
- Web/Internet Services
- VPNs
- Public Key Infrastructure (PKI)
- Secured Electronic Transaction (SET)
- Digital Certificates
- Certificate Authority Design
- Authentication
- Directory Services
- Smart Cards
- Biometrics
- Wireless

Information Assurance Program



Incident Investigation and Assurance Services

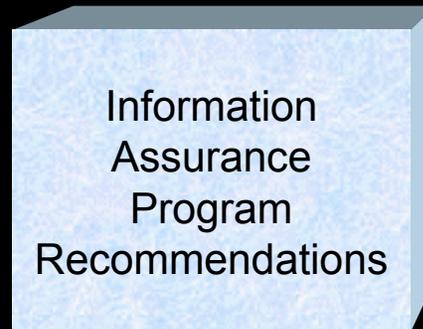
- Investigation and recovery from computer security incidents
- Data Forensics
- Incident Reporting and response services
- CERT/NOC capabilities
- Vulnerability Alerts
- Virus Alerts
- Unauthorized intrusion detection

Information Assurance Program

Where You Are!



Where You Want To Be!



How To Get There!



Building on the strengths of your current Y2K Infrastructure, the next step is to move to a world class Information Assurance Program.

COBIT™

**Information Technology Governance Institute
Control Objectives for Information and related
Technology**

COBIT: An IT control framework

- ◆ Starts from the premise that IT needs to deliver the information that the enterprise needs to achieve its objectives
- ◆ Promotes process focus and process ownership
- ◆ Divides IT into 34 processes belonging to four domains
- ◆ Looks at fiduciary, quality and security needs of enterprises and provides for seven information criteria that can be used to generically define what the business requires from IT

-
- The diagram consists of a large central box on the left containing four bullet points. Two arrows point from this box to two smaller boxes on the right. The top arrow points to a box containing four domains: Planning, Acquiring & Implementing, Delivery & Support, and Monitoring. The bottom arrow points to a box containing seven information criteria: Effectiveness, Efficiency, Availability, Integrity, Confidentiality, Reliability, and Compliance.
- ◆ Planning
 - ◆ Acquiring & Implementing
 - ◆ Delivery & Support
 - ◆ Monitoring

- ◆ Effectiveness
- ◆ Efficiency
- ◆ Availability,
- ◆ Integrity
- ◆ Confidentiality
- ◆ Reliability
- ◆ Compliance

COBIT : An IT control framework

- ◆ A high-level control objective for each process
 - ✓ identifying which information criteria are most important in that IT process
 - ✓ stating which resources will usually be leveraged
 - ✓ providing considerations on what is important for controlling that IT process
- ◆ 318 detailed control objectives for management and IT practitioners
- ◆ Extensive audit guidelines building on these objectives

COBIT Management Guidelines

Answers Key Management Questions

Through the use of:

Maturity Models

Critical Success Factors

Key Goal Indicators

Key Performance Indicators

COBIT Management Guidelines

Generic Maturity Model

0 Non-Existent. Complete lack of any recognizable processes. The organization has not even recognized that there is an issue to be addressed.

1 Initial. There is evidence that the organization has recognized that the issues exist and need to be addressed. There are however no standardized processes but instead there are ad hoc approaches that tend to be applied on an individual or case by case basis. The overall approach to management is disorganised.

2 Repeatable. Processes have developed to the stage where similar procedures are followed by different people undertaking the same task. There is no formal training or communication of standard procedures and responsibility is left to the individual. There is a high degree of reliance on the knowledge of individuals and therefore errors are likely.

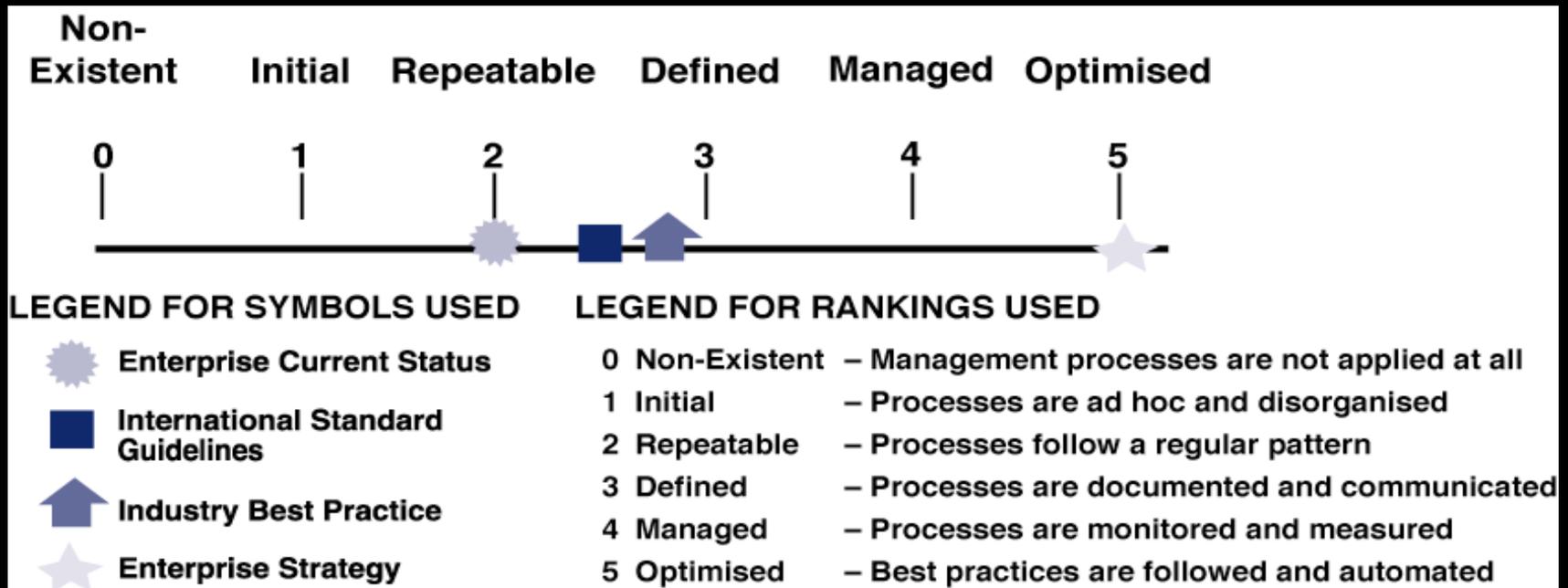
3 Defined. Procedures have been standardized and documented, and communicated through training. It is however left to the individual to follow these processes, and it is unlikely that deviations will be detected. The procedures themselves are not sophisticated but are the formalization of existing practices.

4 Managed. It is possible to monitor and measure compliance with procedures and to take action where processes appear not to be working effectively. Processes are under constant improvement and provide good practice. Automation and tools are used in a limited or fragmented way.

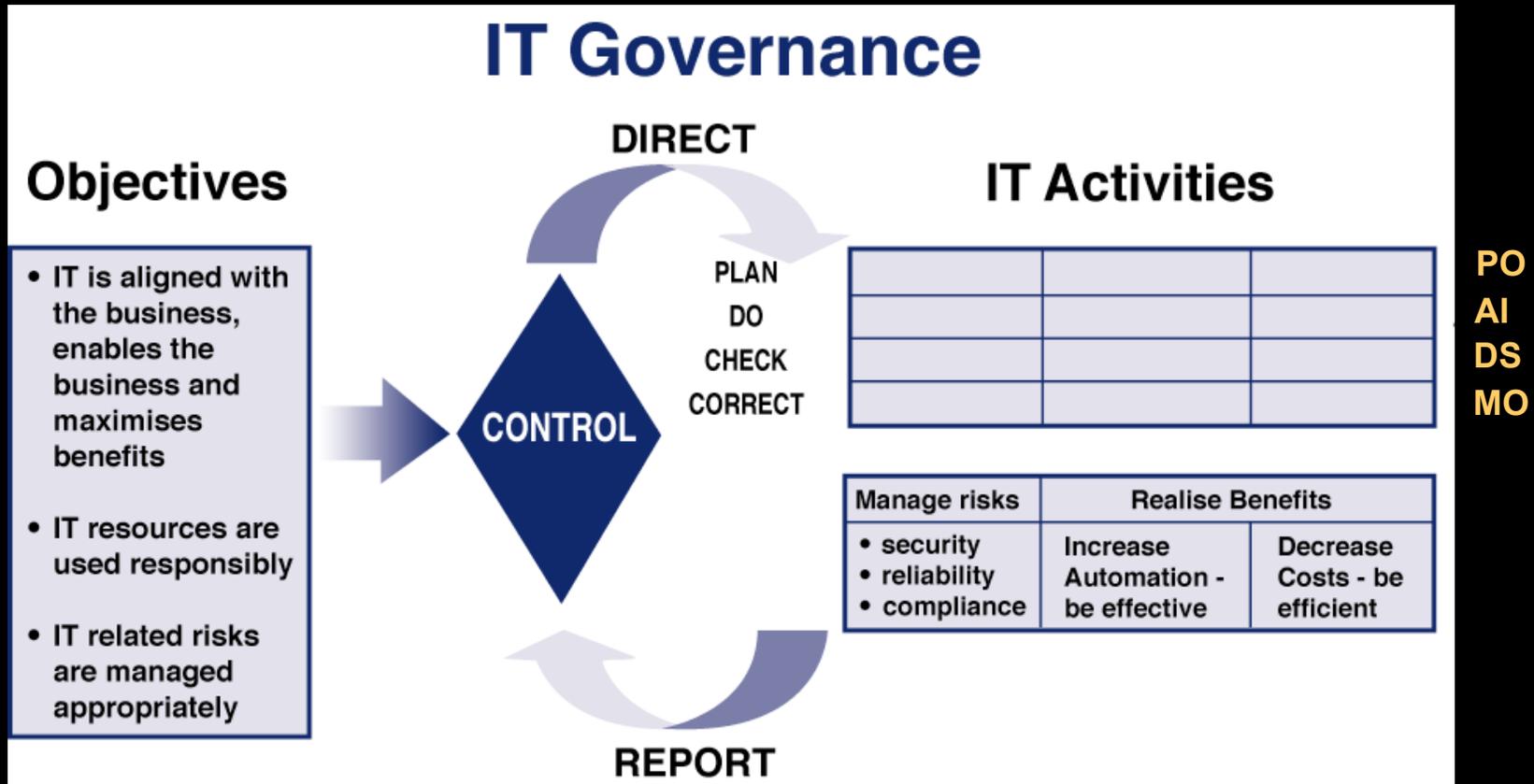
5 Optimized. Processes have been refined to a level of best practice, based on the results of continuous improvement and maturity modeling with other organizations. IT is used in an integrated way to automate the workflow, providing tools to improve quality and effectiveness, making the enterprise quick to adapt.

COBIT Management Guidelines

Maturity Models for Self-Assessment



IT Governance



SysTrustSM

**American Institute of Certified Public
Accountants/Canadian Institute of Chartered
Accountants**

Systems Reliability Assurance Service

SysTrust

Opinion on controls

- Based on a framework of principles & criteria
- Identify and assess the operating effectiveness of controls that support the criteria

A system must meet all principles & all criteria to be considered “Reliable”

- Reporting on less than 4 principles is permitted
- All criteria related to the principle must be met

SysTrust as an Assurance Service

SysTrust used to manage internal risk

- New applications being developed and/or implemented
- Applications already in use

SysTrust use to manage 3rd party risk

Partner systems

- 3rd party service-bureau systems
- Online marketplaces/exchanges

SysTrust as Consulting Engagement

SysTrust is a benchmark on controls

Opportunity to identify control weaknesses

Current engagements started as consulting

Greater market for Consulting or Assurance?

SysTrust

System reliability is defined as:

“A system that operates without material error, fault or failure during a specified time in a specified environment.”

Four Principles:

- Availability
- Security
- Integrity
- Maintainability

Managing Security of Information

International Federation of Accountants

International Information Technology Guideline

Managing Security of Information

Core Principles

Accountability - *Responsibility and accountability must be explicit*

Awareness - *Awareness of risks and security initiatives must be disseminated*

Multidisciplinary - *Security must be addressed taking into consideration both technological and non-technological issues*

Cost Effectiveness - *Security must be cost-effective*

Managing Security of Information

Core Principles

Integration - *Security must be coordinated and integrated*

Reassessment - *Security must be reassessed periodically*

Timeliness - *Security procedures must provide for monitoring and timely response*

Societal Factors - *Ethics must be promoted by respecting the rights and interests of others*

Managing Security of Information

Implementation Approach

Policy Development

Roles and Responsibilities

Design

Implementation

Monitoring

Awareness, Training, and Education

INFORMATION SECURITY POLICY STATEMENT EXAMPLE

Board Briefing on Information Technology Governance

Information Security Governance

**Co-Badged by a Number of Leading
Organizations**

Information Technology Governance

“IT governance is the term used to describe how those persons entrusted with governance of an entity will consider IT in their supervision, monitoring, control and direction of the entity. How IT is applied within the entity will have an immense impact on whether the entity will attain its vision, mission or strategic goals.”

ITGI document: Board Briefing on Information Technology Governance

Information Security Governance

“Executive management has a responsibility to ensure that the organization provides all users with a secure information systems environment. Furthermore, organizations need to protect themselves against the risks inherent in the use of information systems while simultaneously recognising the benefits that can accrue from having secure information systems.”

ITGI document: Information Security Governance

Center for Internet Security

Center for Internet Security

is developing:

- best-practice benchmarks that define the specific technical settings that will provide increased security for Internet-connected systems
- a security ruler that defines which of those specific settings will increase the relative security of your systems
- automated tools to continuously monitor the security status of your systems

Web Sites

- COBIT™ -- www.itgi.org
- SysTrustSM -- www.aicpa.org
- Managing Security of Information -- www.ifac.org
- Board Briefing on Information Technology Governance -- www.itgi.org
- Information Security Governance – www.itgi.org
- Center for Internet Security – www.cisecurity.org

QUESTIONS?

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