IT and Security Standards
A Practical Approach to Implementation

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Agenda

- Introductions
- IT and Security Standards Landscape
- Standards Setting Process
- Comparison of Standards
- Use of Standards
- Questions

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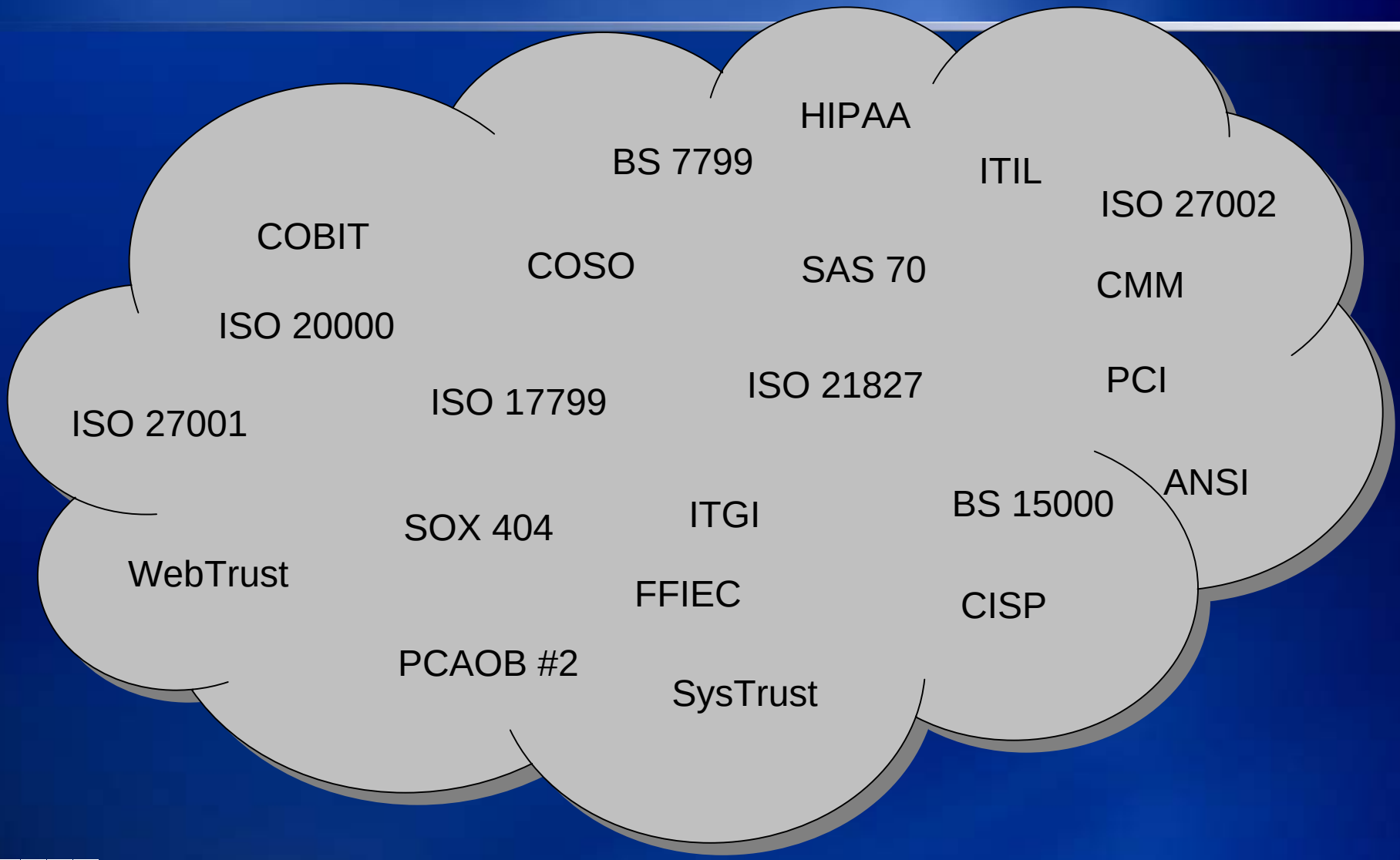
Introductions

IT and Security Standards Landscape

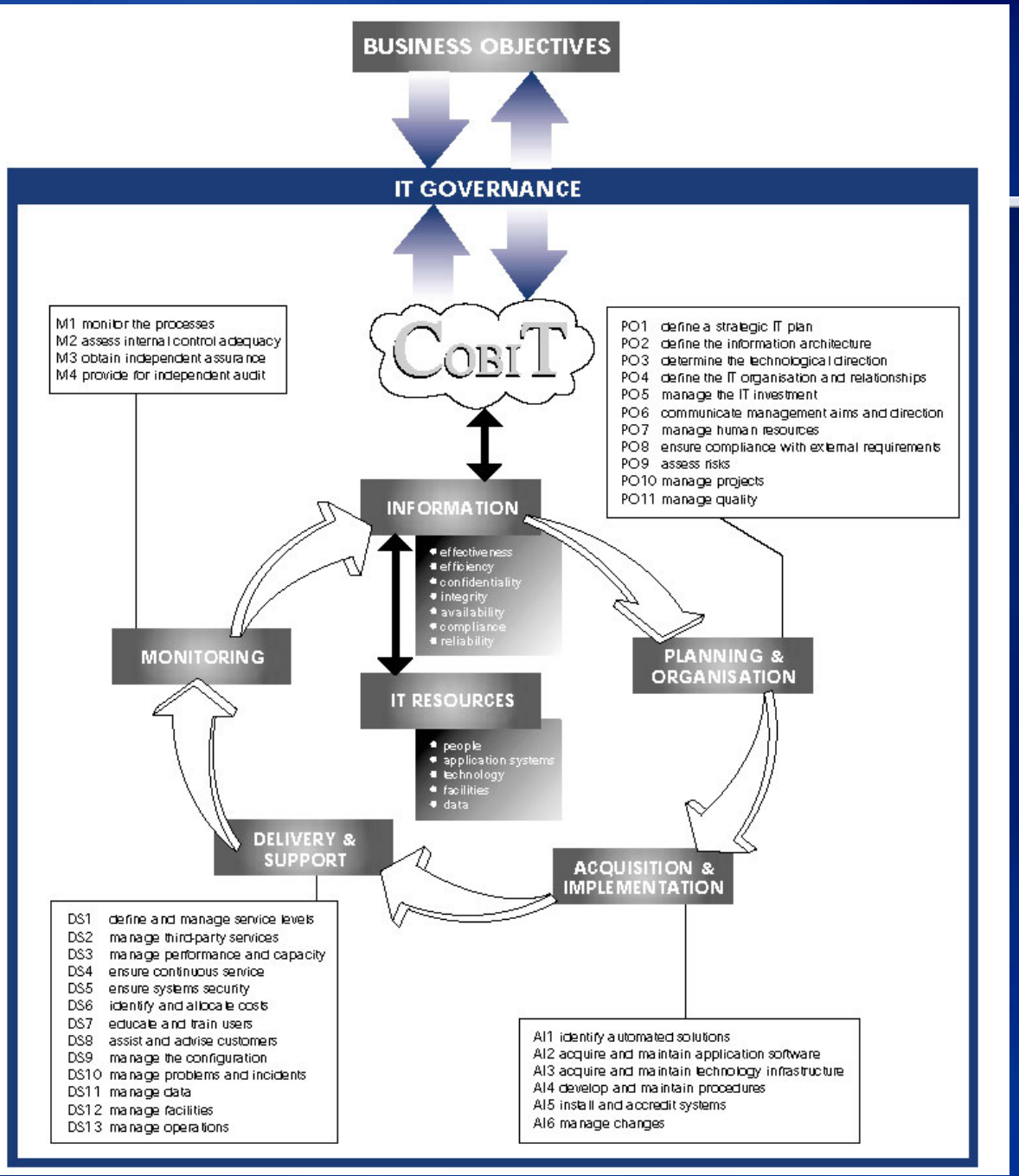
So Many Standards



COBIT

- **COBIT has been developed as a generally applicable and accepted standard for good Information Technology (IT) security and control practices that provides a reference framework for management, users, and IS audit, control and security practitioners.**
- **COBIT, issued by the IT Governance Institute and now in its third edition, is increasingly internationally accepted as good practice for control over information, IT and related risks.**
- **Core components include:**
  - Framework with high level control objectives
  - Management guidelines
  - Detailed control objectives
  - Audit guidelines
- **COBIT (version 4.0), planned for release in November 2005 has been enhanced to provide better integration with other more detailed, guidance such as ITIL ISO 17799.**

COBIT – Scope



BS 7799-1 / ISO 17799

- **Developed by British Standards Institution (BSI)**
- **Maintained by ISO/IEC/JTC 1 (Information Technology)/SC 27 (IT Security Techniques)**
- **ISO/IEC 17799:2005, BS 7799-1:2005 Information technology. Security techniques. Code of practice for information security management**
  - This standard gives recommendations for information security management for use by those who are responsible for initiating, implementing or maintaining security in their organization. It is intended to provide a common basis for developing organizational security standards and effective security management practice and to provide confidence in inter-organizational dealings. Recommendations from this standard should be selected and used in accordance with applicable laws and regulations.
- **ISO 17799 will be renumbered to ISO 27002 in the future.**

BS 7799-2 / ISO 27001

- **Developed by British Standards Institution (BSI)**
- **Maintained by ISO/IEC/JTC 1 (Information Technology)/SC 27 (IT Security Techniques)**
- **BS 7799-2:2002 Information security management systems - Specification with guidance for use**
  - This standard specifies the requirements for establishing, implementing, operating, monitoring, reviewing, maintaining and improving a documented ISMS within the context of the organization's overall business risks. It specifies requirements for the implementation of security controls customized to the needs of individual organizations or parts thereof.
- **ISO/IEC FDIS 27001:2005, Draft BS 7799-2:2005 Information technology – Security techniques – Information Security Management Systems – Requirements (to be published late 2005)**

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BS 7799 / ISO 17799 – Model

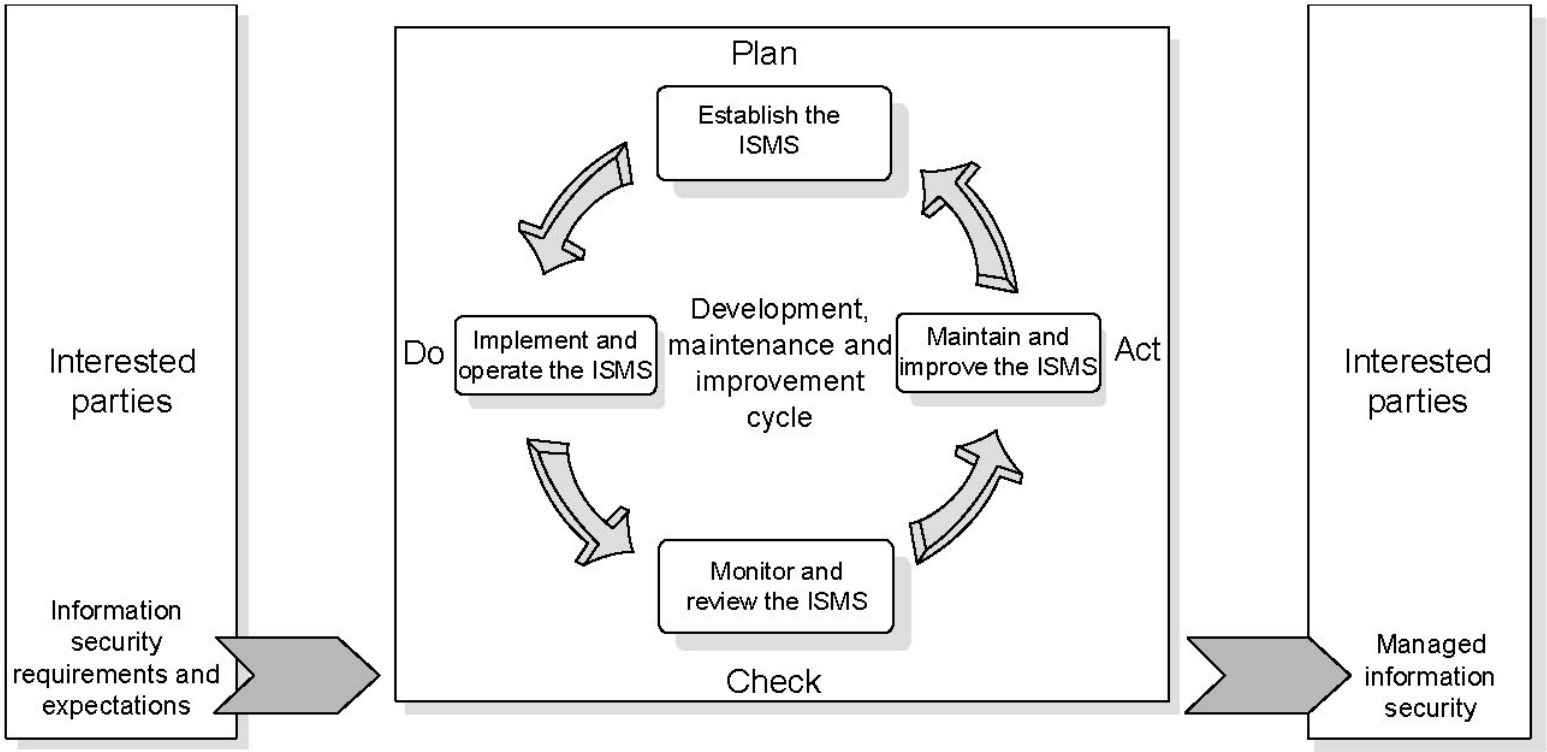

Figure 1 — PDCA model applied to ISMS processes

BS 7799 / ISO 17799 – Scope

- **Information Security Management System (ISMS)**
  - Define scope, policy
  - Risk assessment
  - Address risks
  - Implement and operate
  - Monitor and review
  - Maintain and improve
  - Management commitment

- **Security Policy**
- **Organizational Security**
- **Asset Classification and Control**
- **Personnel Security**
- **Physical and Environmental Security**
- **Communications and Operations Management**
- **Access Control**
- **Systems Development and Maintenance**
- **Business Continuity Management**
- **Compliance**

ITIL

- **Developed by Office of Government Commerce (UK)**
- **ITIL is intended to assist organizations to develop a framework for IT Service Management.**

- **IT Service Management is:**
  - a top-down, business driven approach to the management of IT that specifically addresses
    - the strategic business value generated by the IT organization
    - the need to deliver a high quality IT service.
  - designed to focus on the people, processes and technology issues that IT organizations face.

ITIL – Scope

- Service Support
- Service Delivery
- Planning to Implement Service Management
- Application Management
- ICT Infrastructure Management
- Security Management
- Software Asset Management
- The Business Perspective: The IS View on Delivering Services to the Business

BS 15000-1 / ISO 20000-1

- **Developed by British Standards Institution (BSI) based largely on ITIL**
- **Maintained by ISO/IEC/JTC 1 (Information Technology)/SC 7 (Software and System Engineering)**
- **BS 15000-1:2002 IT service management, Part 1: Specification for service management**
  - This specification defines the requirements for an organization to deliver managed services of an acceptable quality for its customers.
- **ISO/IEC DIS 20000-1 (ISO version being finalized)**

BS 15000-2 / ISO 20000-2

- **Developed by British Standards Institution (BSI) based largely on ITIL**
- **BS 15000-2:2003 IT service management, Part 2: Code of practice for service management**
  - BS 15000-2 represents an industry consensus on quality standards for IT service management processes. These service management processes deliver the best possible service to meet an organization's business needs within agreed resource levels, i.e. service that is professional, cost-effective and with risks which are understood and managed.
- **ISO/IEC DIS 20000-2 (ISO version being finalized)**

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BS 15000 – Methodology

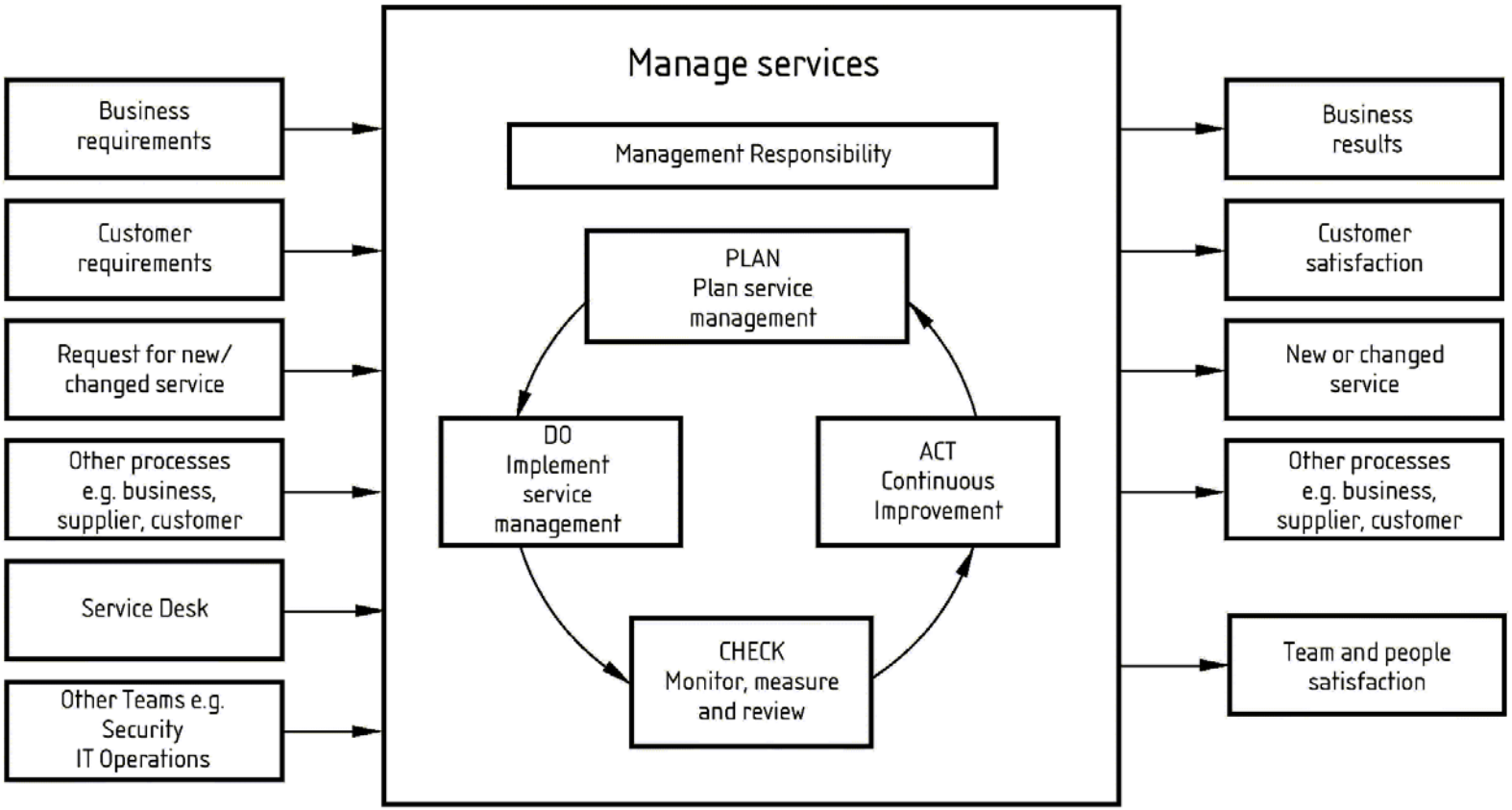
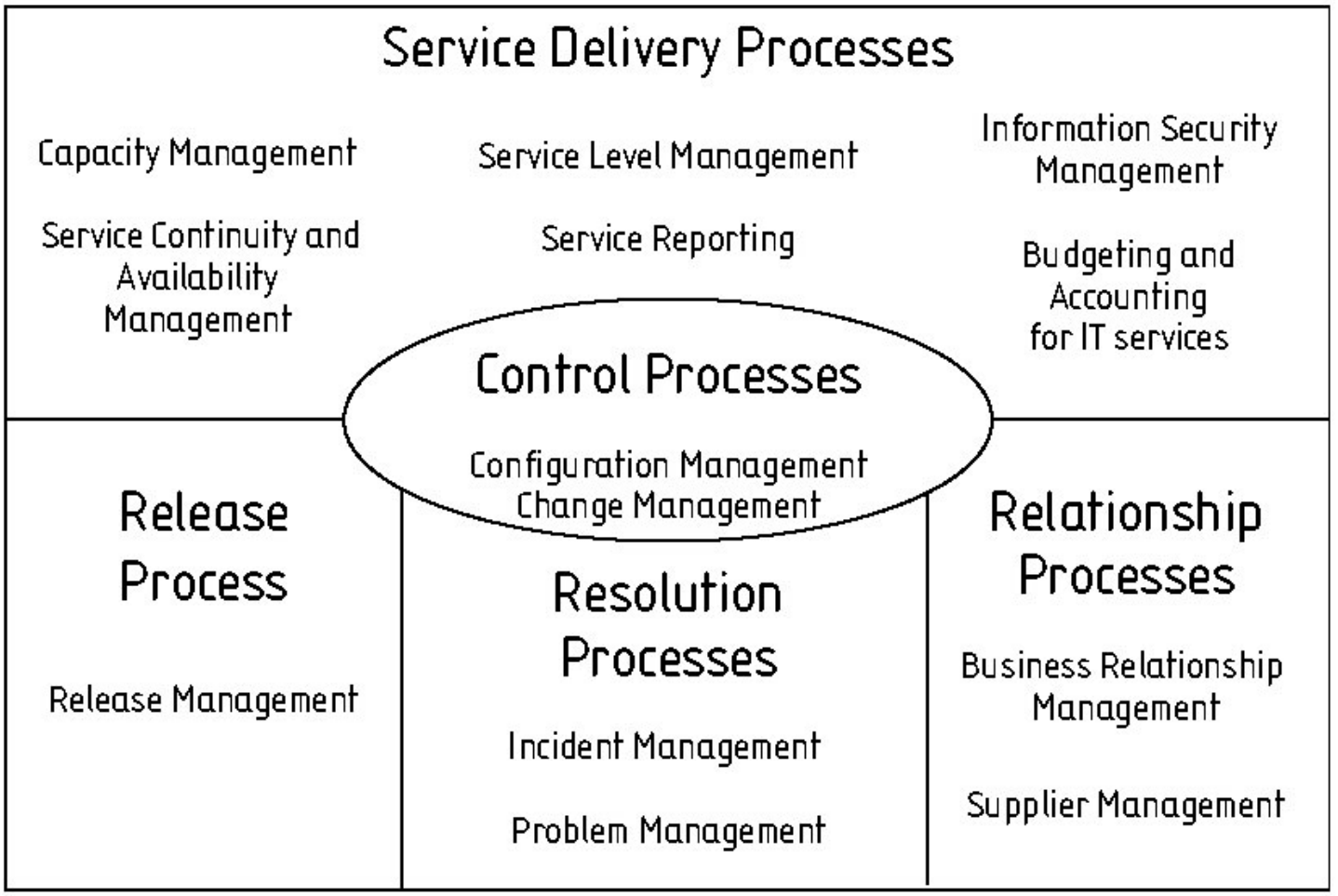


Figure 1 — Plan-Do-Check-Act methodology for service management processes

BS 15000 – Scope



Sarbanes-Oxley Act of 2002 (SOX)

Section 302 Management Requirements

- Section 302 requires a company's management, with the participation of the principal executive and financial officers (the certifying officers), to make the following quarterly and annual certifications with respect to the company's internal control over financial reporting:
  - A statement that the certifying officers are **responsible for establishing and maintaining internal control** over financial reporting
  - A statement that the certifying officers have **designed such internal control** over financial reporting, or caused such internal control over financial reporting to be designed under their supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles
  - A statement that the report **discloses any changes** in the company's internal control over financial reporting that occurred during the most recent fiscal quarter (the company's fourth fiscal quarter in the case of an annual report) that have materially affected, or are reasonably likely to materially affect, the company's internal control over financial reporting.

Section 404 Management Requirements

- Requires the SEC to prescribe rules requiring each annual report required by section 13(a) or 15(d) of the Securities Exchange Act of 1934 to contain an internal control report, which shall: (1) state the **responsibility of management** for establishing and maintaining an adequate internal control structure and procedures for financial reporting and (2) contain an **assessment**, as of the end of the most recent fiscal year of the issuer, of the effectiveness of the internal control structure and procedures of the issuer for financial reporting.
- With respect to the internal control assessment required by this section, each registered public accounting firm that prepares or issues the audit report for the issuer shall **attest to, and report on, the assessment made by the management** of the issuer. Such attestation shall be made in accordance with standards for attestation engagements issued or adopted by the Board. Any such attestation shall not be the subject of a separate engagement.

Source: http://www.theiia.org

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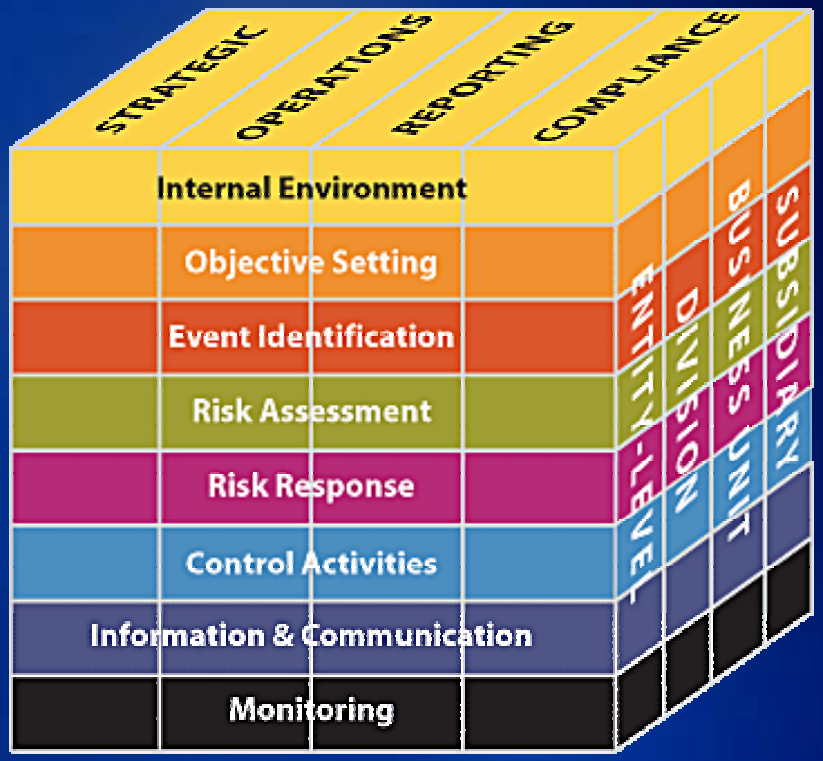
COSO

- Developed by the Committee of Sponsoring Organizations of the Treadway Commission
- COSO is a voluntary private sector organization dedicated to improving the quality of financial reporting through business ethics, effective internal controls, and corporate governance.
- COSO was originally formed in 1985 to sponsor the National Commission on Fraudulent Financial Reporting, an independent private sector initiative which studied the causal factors that can lead to fraudulent financial reporting and developed recommendations for public companies and their independent auditors, for the SEC and other regulators, and for educational institutions.
- The National Commission was jointly sponsored by five major professional associations in the United States, the American Accounting Association, the American Institute of Certified Public Accountants, Financial Executives International, The Institute of Internal Auditors, and the National Association of Accountants (now the Institute of Management Accountants).

COSO (continued)

- **Internal Control - Integrated Framework (1994)**

COSO's Enterprise Risk Management — Integrated Framework (2004)



PCAOB #2

- **Auditing Standard No. 2 – An Audit of Internal Control Over Financial Reporting Performed in Conjunction with An Audit of Financial Statements (2004)**
  - This standard establishes requirements and provides directions that apply when an auditor is engaged to audit both a company's financial statements and management's assessment of the effectiveness of internal control over financial reporting.
- **Section 13. Management is required to base its assessment of the effectiveness of the company's internal control over financial reporting on a suitable, recognized control framework established by a body of experts that followed due-process procedures, including the broad distribution of the framework for public comment.**
- **Section 14. In the United States, the Committee of Sponsoring Organizations ("COSO") of the Treadway Commission has published Internal Control – Integrated Framework. Known as the COSO report, it provides a suitable and available framework for purposes of management's assessment.**

PCAOB #2 (continued)

- Section 50. Some controls (such as company-level controls, described in paragraph 53) might have a pervasive effect on the achievement of many overall objectives of the control criteria. For example, information technology general controls over program development, program changes, computer operations, and access to programs and data help ensure that specific controls over the processing of transactions are operating effectively.

ITGI – IT Control Objectives for Sarbanes-Oxley

- **IT Control Objectives for Sarbanes-Oxley: The Importance of IT in the Design, Implementation and Sustainability of Internal Control Over Disclosure and Financial Reporting (2004)**
  - This research is intended as a reference for executive management and IT control professionals, including IT management and assurance professionals, when evaluating an organization's IT controls as required by the US Sarbanes-Oxley Act of 2002 (the "Act").
- **Based on COBIT, COSO, SOX 404 and PCAOB#2.**
- **Developed by the IT Governance Institute (ITGI)**
  - Affiliated with the Information Systems Audit and Control Association (ISACA)
  - Established in 1998 as a research think tank in recognition of the increasing criticality of information technology to enterprise success.

ITGI – IT Control Objectives for Sarbanes-Oxley – Scope

- **IT General Controls - Program Development and Program Change**
  - Acquire or develop application system software
  - Acquire technology infrastructure
  - Develop and maintain policies and procedures
  - Install and test application software and technology infrastructure
  - Manage changes
- **IT General Controls - Computer Operations and Access to Programs and Data**
  - Define and manage service levels
  - Manage third-party services
  - Ensure systems security
  - Manage the configuration
  - Manage problems and incidents
  - Manage data
  - Manage operations
- **Company Level Controls**
  - Control Environment
  - Information and Communication
  - Risk Assessment
  - Monitoring
- **Application Controls—Business Cycles**
  - Sales Cycle
  - Purchasing Cycle
  - Inventory Cycle
  - Asset Management Cycle
  - Human Resources Cycle

CMM / ISO 21827

- **ISO/IEC 21827:2002 Information technology -- Systems Security Engineering -- Capability Maturity Model (SSE-CMM)**
  - Maintained by the International Systems Security Engineering Association (ISSEA) and ISO JTC 1/SC 27 (IT Security techniques)
  - The SSE-CMM is a process reference model. It is focused upon the requirements for implementing security in a system or series of related systems that are the information technology security (ITS) domain. Within the ITS domain the SSE-CMM Model is focused on the processes used to achieve ITS, most specifically on the maturity of those processes.
  - The SSE-CMM describes the essential characteristics of an organization's security engineering process that must exist to ensure good security engineering.

CMM / ISO 21827 – Scope

- **Security Engineering Process Areas**
  - PA01 Administer Security Controls
  - PA02 Assess Impact
  - PA03 Assess Security Risk
  - PA04 Assess Threat
  - PA05 Assess Vulnerability
  - PA06 Build Assurance Argument
  - PA07 Coordinate Security
  - PA08 Monitor Security Posture
  - PA09 Provide Security Input
  - PA10 Specify Security Needs
  - PA11 Verify and Validate Security

- **Project and Organizational Process Areas**
  - PA12 - Ensure Quality
  - PA13 - Manage Configuration
  - PA14 - Manage Project Risk
  - PA15 - Monitor and Control Technical Effort
  - PA16 - Plan Technical Effort
  - PA17 - Define Organization's Systems Engineering Process
  - PA18 - Improve Organization's Systems Engineering Process
  - PA19 - Manage Product Line Evolution
  - PA20 - Manage Systems Engineering Support Environment
  - PA21 - Provide Ongoing Skills and Knowledge
  - PA22 - Coordinate with Suppliers

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CMM / ISO 21827 – Capability Levels

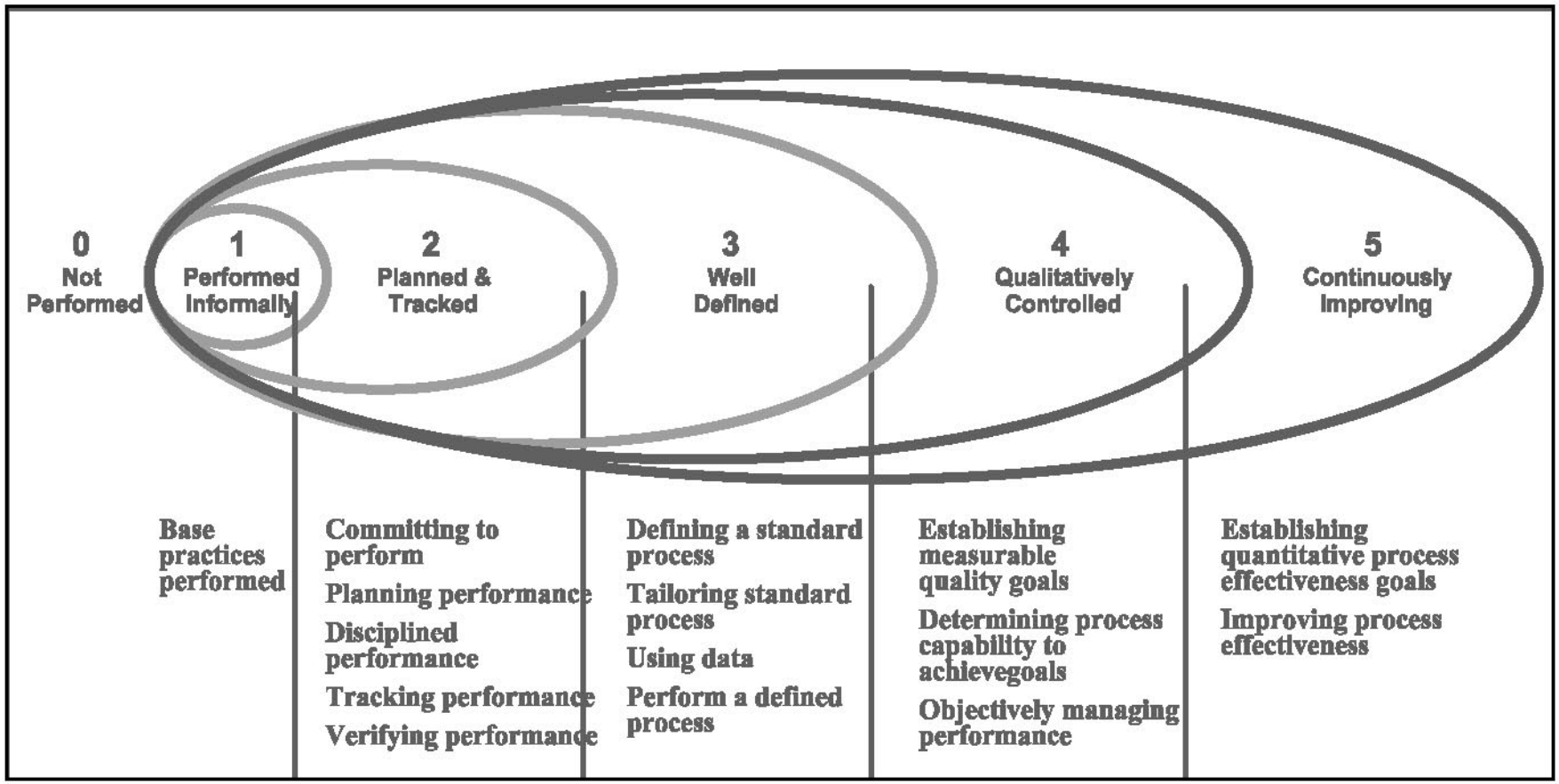

Figure 6 - Capability levels represent the maturity of security engineering organizations.

Examples of ISO Standards

- **The following are examples of standards developed within the TC68/SC2 financial services security working groups:**
  - ISO/TR13569 Financial services - Information security guidelines
  - ISO TR 17944: 2002- ISO TR 17944 Framework for Security in Financial Systems
  - ISO 15782-1- Certificate management for financial services -- Part 1: Public key certificates
  - ISO 15782-2- Banking -- Certificate management -- Part 2: Certificate extensions
  - ISO 21188 - Banking Public Key Infrastructure - Part 1: Practices and Policy Framework
  - ISO 19092-1 – Financial Services Biometrics – Part 1: Security Framework
  - ISO 19092-2 – Financial Services Biometrics – Part 2: Cryptographic Techniques
  - ISO 10126-1 Banking – Procedures for message encipherment (wholesale) – Part 1: General principles
  - ISO 10126-2 Banking – Procedures for message encipherment (wholesale) – Part 2: DEA algorithm
  - TR 19038 Banking and related financial services - Part 1-Triple data encryption algorithm modes of operation

Examples of ANSI Standards

- Examples of American National Standards Institute (ANSI) standards developed through the Accredited Standards Committee (ASC) X9 (Financial Services) standards organization include:
  - ANS X9.19 Financial Institution Retail Message Authentication
  - ANS X9.24:1 Financial Services Key Management – Part 1: Using Symmetric Techniques
  - ANS X9.30:1 Public Key Cryptography, The Digital Signature Algorithm
  - ANS X9.30:2 Public Key Cryptography, The Secure Hash Algorithm
  - ANS X9.31 Digital Signatures Using Reversible Public Key Cryptography for the Financial Services Industry
  - ANS X9.49 Secure Remote Access to Financial Services for the Financial Industry
  - ANS X9.52 Triple Data Encryption Algorithm Modes of Operation
  - ANS X9.62 Public Key Cryptography for the Financial Services ECDSA
  - ANS X9.63 Public Key Cryptography for the Financial Services Industry: Key Agreement and Key Transport Using Elliptic Curve Cryptography
  - ANS X9.65 Triple Data Encryption Algorithm (TDEA) Implementation
  - ANS X9.68:2 Digital Certificates for Mobile/Wireless and High Transaction Volume Financial Systems
  - ANS X9.79-1 PKI Practices and Policy Framework
  - ANS X9.84 Biometric Information Management and Security for the Financial Services Industry
  - TG-4 Recommended Notation for DEA Key Management in Retail Financial Networks
  - TG-5 Information Security Guideline
  - TG-19-1 Triple DES Validation System Procedures
  - TG-19-4 Secure Hash Algorithm Validation System (SHAVS): Requirements and Procedures

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Examples of Industry Requirements PCI

- **Payment Card Industry Data Security Standard (PCI)**
  - Developed by Visa and MasterCard
  - Supercedes Visa's Cardholder Information Security Program (CISP) and MasterCard's Site Data Protection (SDP) programs
  - This standard is the result of collaboration between Visa and MasterCard to create common industry security requirements.
  - Applies to merchants and service providers (i.e., processors and payment gateways)

PCI – Scope

- **Build and Maintain a Secure Network**
  - Install and maintain a firewall configuration to protect data
  - Do not use vendor-supplied defaults for system passwords and other security parameters
- **Protect Cardholder Data**
  - Protect stored data
  - Encrypt transmission of cardholder data and sensitive information across public networks
- **Maintain a Vulnerability Management Program**
  - Use and regularly update anti-virus software
  - Develop and maintain secure systems and applications
- **Implement Strong Access Control Measures**
  - Restrict access to data by business need-to-know
  - Assign a unique ID to each person with computer access
  - Restrict physical access to cardholder data
- **Regularly Monitor and Test Networks**
  - Track and monitor all access to network resources and cardholder data
  - Regularly test security systems and processes.
- **Maintain an Information Security Policy**
  - Maintain a policy that addresses information security

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Examples of Industry Requirements FFIEC

- **Federal Financial Institutions Examination Council (FFIEC)– Information Security IT Examination Handbook (2002)**
  - This booklet provides guidance to examiners and organizations on determining the level of security risks to the organization and evaluating the adequacy of the organization's risk management.
- **Topics covered include:**
  - Security Process
  - Information Security Risk Assessment
  - Information Security Strategy
  - Security Controls Implementation
  - Security Testing
  - Monitoring and Updating

Examples of Industry Requirements HIPAA

- **Department of Health and Human Services - Health Insurance Reform: Security Standards; Final Rule (2003)**
  - This final rule adopts standards for the security of electronic protected health information to be implemented by health plans, health care clearinghouses, and certain health care providers.
  - This final rule implements some of the requirements of the Administrative Simplification subtitle of the Health Insurance Portability and Accountability Act of 1996 (HIPAA).
- **The scope includes:**
  - Administrative safeguards
  - Physical safeguards
  - Technical safeguards
  - Organizational requirements
  - Policies and procedures and documentation requirements

SAS 70

- **Statement of Auditing Standards (SAS) No. 70, Service Organizations**
- **Audit reporting framework for service organizations defined by AICPA**
- **Type 1 report covers design and controls placed in operation**
- **Type 2 adds tests of operating effectiveness**
- **Report structure:**
  - Auditor's opinion
  - Service provider's description of controls
    - Overview of operations
    - Control objectives
    - Supporting control procedures
    - COSO components
  - Auditor's tests of operating effectiveness and results
  - Other information

- **Typical IT control objective topics include, but are not limited to:**
  - Systems development
  - Change management
  - Logical access
  - Physical access
  - Operations management
  - Job processing
  - Communications security

Trust Services (WebTrust/SysTrust)

- **AICPA/CICA Trust Services Criteria:**
  - Security
  - Availability
  - Processing Integrity
  - Online Privacy
  - Confidentiality
- **There are four levels of requirements:**
  - Policies
  - Communications
  - Procedures
  - Monitoring
- **The WebTrust reporting framework is focused on online systems whereas SysTrust applies to any type of system.**
- **WebTrust for Certification Authorities (WebTrust for CAs) applies specifically to public key infrastructure (PKI) / certification authority (CA) systems and includes requirements for CA Business Practices, CA Environmental Controls, CA Key Life Cycle Management, and Certificate Life Cycle Management.**

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Standards Setting Process

ISO Technical Committees

There are over 200 ISO technical committees:

- **JTC 1 Information technology**
- **TC 1 Screw threads**
- **TC 2 Fasteners**
- **TC 3 Limits and fits**
- **TC 4 Rolling bearings**
- **TC 5 Ferrous metal pipes and metallic fittings**
- **TC 6 Paper, board and pulps**
- **TC 8 Ships and marine technology**
- **TC 10 Technical product documentation**
- **…**
- **TC 68 Financial services**
- **TC 69 Applications of statistical methods**
- **TC 70 Internal combustion engines**
- **…**
- **TC 227 Springs**
- **TC 228 Tourism and related services**
- **TC 229 Nanotechnologies**

Committees are structured as follows:

- **Technical Committee**
  - Subcommittees
    - Working groups

For Example:

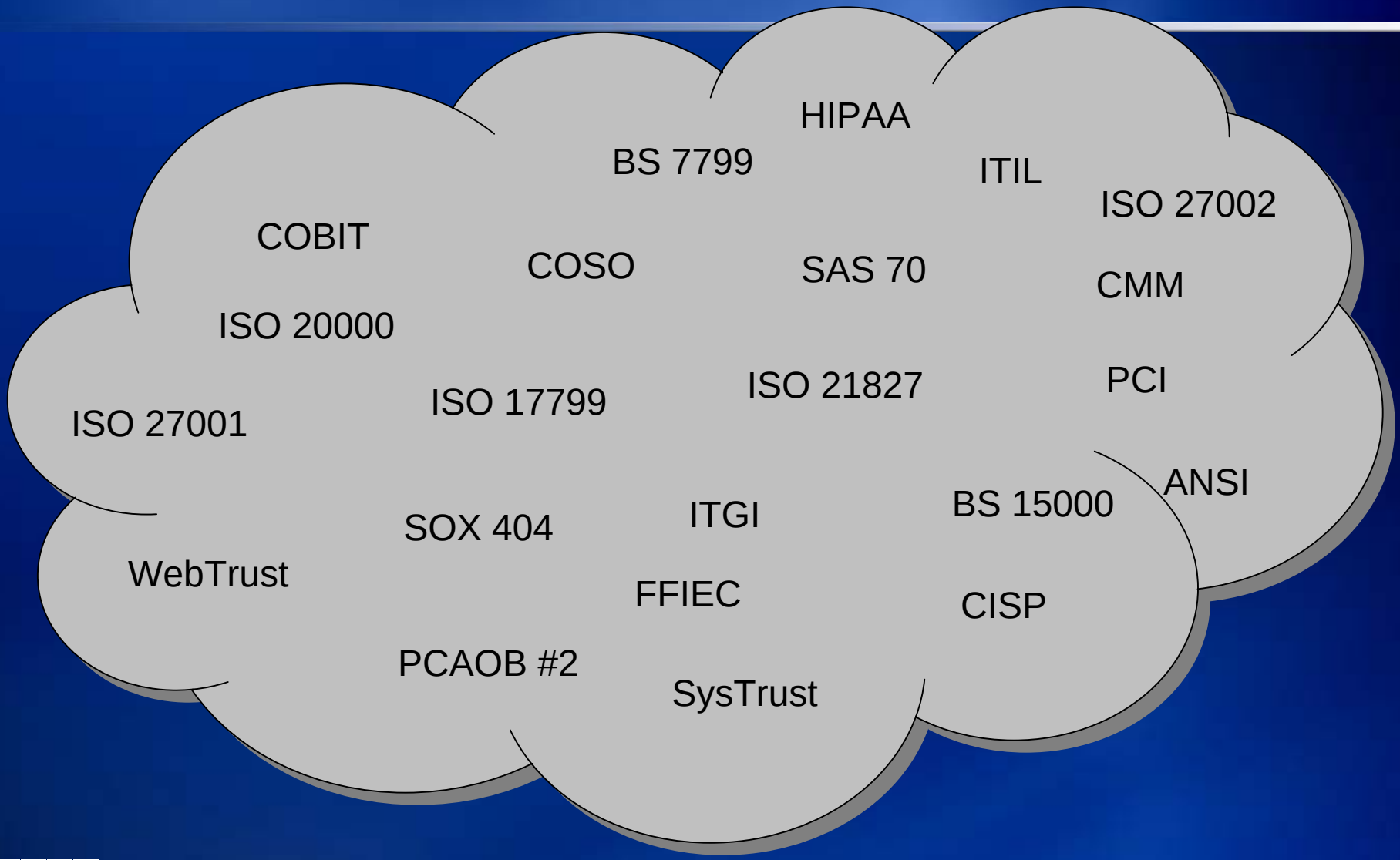
- **ISO/IEC JTC 001 Information technology**
  - SC 07 - Software and System Engineering
  - SC 27 - IT Security Techniques
  - SC 37 - Biometrics
- **TC 68 Financial Services**
  - SC2 Financial Services Security
    - WG4 Information Security Guidelines for Banking
    - WG8 Certificate Management for Financial Services
    - WG11 Encryption Algorithms Used in Banking Applications
    - WG13 Security in Retail Banking

ISO Process

STAGE	SUB-STAGE						
	00	20	60	90 Decision			
	Registration	Start of main action	Completion of main action	92 Repeat an earlier phase	93 Repeat current phase	98 Abandon	99 Proceed
00 Preliminary stage	00.00 Proposal for new project received	00.20 Proposal for new project under Review	00.60 Review summary circulated			00.98 Proposal for new project abandoned	00.99 Approval to ballot proposal for new project
10 Proposal stage	10.00 Proposal for new project registered	10.20 New project ballot initiated	10.60 Voting summary circulated	10.92 Proposal returned to submitter for further definition		10.96 New project rejected	10.99 New project approved
20 Preparatory Stage	20.00 New project registered in TC/SC work program	20.20 Working draft (WD) study initiated	20.60 Comments summary circulated			20.98 Project deleted	20.99 WD approved for registration as CD
30 Committee Stage	30.00 Committee draft (CD) registered	30.20 CD study ballot initiated	30.60 Comments/voting summary circulated	30.92 DC referred back to Working Group		30.98 Project deleted	30.99 CD approved to registration as DIS
40 Enquiry stage	40.00 DIS registered	40.20 DIS ballot initiated: 5 months	40.60 Voting summary dispatched	40.92 Full report circulated: DIS referred bank to TC or SC	40.93 Full report circulated decision for new DIS ballot	40.98 Project deleted	40.99 Full report circulated DIS approved for registration as FDIS
50 Approval stage	50.00 FDIS registered for formal approval	50.20 FDIS ballot initiated: 2 months. Proof sent to secretariat	50.60 Voting summary dispatched. Proof returned by secretariat	50.92 FDIS referred back to TC or SC		50.98 Project deleted	50.99 FDIS approved for publication
60 Publication Stage	60.00 International Standard under publication		60.60 International Standard published				
90 Review stage		90.20 International Standard under periodical review	90.60 Review summary dispatched	90.92 International standard to be revised	90.93 International Standard confirmed		90.99 Withdrawal of International Standard proposed by TC or SC
95 Withdrawal Stage		95.20 Withdrawal Ballot initiated	95.60 Voting summary dispatched	95.92 Decision not to withdraw International Standard			95.99 Withdrawal of International Standard

Comparison of Standards

So Many Standards



High Level Standards Roadmap

	Control Environment/ Company Level Controls	Information Security	IT Service Delivery / Operations	Systems Development	Financial Reporting Systems	Specific Technologies or Incremental Requirements
Best Practices Guidance	COBIT					
	COSO	BS 7799-1/ ISO 17799	ITIL BS15000-2/ ISO 20000-2	CMM/ ISO 21827	ITGI-SOX	ISO various ANSI various
Certification/ Audit Criteria/ Requirements		BS 7799-2/ ISO 27001	BS 15000-1/ ISO 20000-1			
Regulatory/ Industry Requirements		PCI FFIEC HIPAA			SOX PCAOB	
Audit Framework	SAS 70 & Trust Services				PCAOB	WebTrust for CAs

Use of Standards / Putting it All Together

Putting It All Together

- **Standards can be used as:**
- **a guide for defining internal control objectives and developing internal policies**
- **a guide for assessing current controls against an industry standard**
  - Design vs. effectiveness
  - In place vs. not in place
  - Levels of maturity
- **a basis for external certification / audits**
- **a guide for defining requirements for third parties (e.g., security requirements, service level agreements)**
- **a basis for assessing compliance with agreements**

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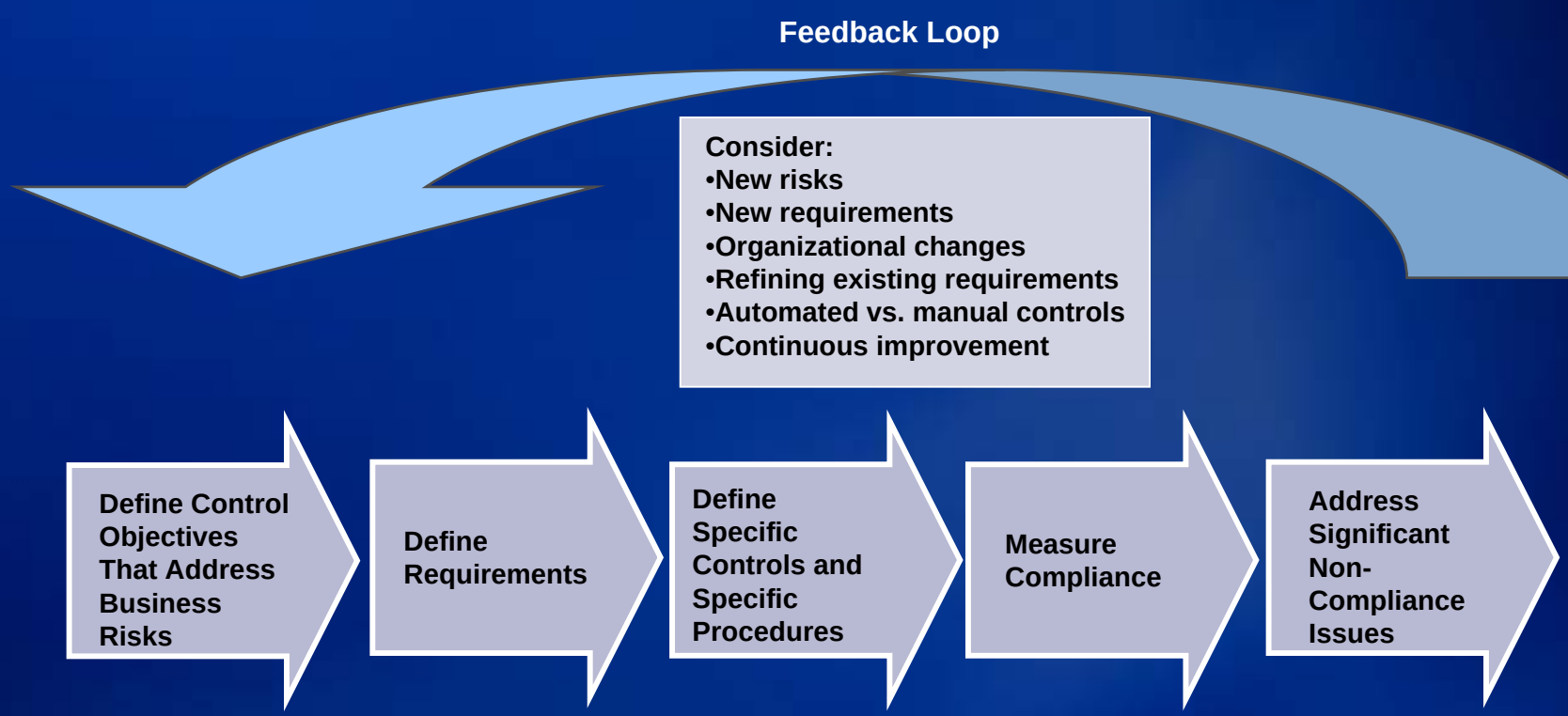
A Standards-Based Approach



Use the most relevant standard as a foundation and add relevant incremental requirements of other standards, regulations, etc. as needed.

Risks

- Avoid the endless cycle of mapping.
- Avoid the temptation to address obscure topics.
- Avoid the tendency to search for something that “sort of” meets the requirement.
- Avoid unclear measurement criteria

Questions

For More Information

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