

ISM3 v1.2

Information Security Management Maturity Model



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Traditional approach to security:

- **“We want to prevent attacks from succeeding”**. With this approach, to be secure means to be *invulnerable*.
- An incident is any loss of confidentiality, integrity or availability.
- You look at a piece of data and think: Is it confidential, has it got integrity, is it available?



ISM3 Approach

- **“We want to guarantee that our business goals are met”**. With this approach, to be secure means to be reliable, despite attacks, accidents and errors.
- An incident is a failure to meet a security objective resulting from accidents, errors or attacks.
- Using ISM3 you look at a piece of data and think: What properties of this data must be protected for it to have business value?

Traditional Approach

MANAGEMENT FOCUS



TECHNICAL FOCUS

ISM3 Business Focus

MANAGEMENT FOCUS



TECHNICAL FOCUS



ISM3 Business Focus

- Business Objectives – Fundamental to the existence of an organization. Resilience depends on security objectives.
- Security Objectives are derived from business objectives and specify the goals of the ISM.
- Security Targets measure the achievement of security objectives in business terms.



ISM3 - What needs protection?

- Business Objectives examples:
 - Paying taxes in time;
 - Invoice all products and services provided;
 - Keep any records needed to pass successfully any audit, like a tax audit or a software licenses audit.
- Security Objectives.
- Security Targets.



ISM3 - What protection is needed?

- Business Objectives.
- Security Objectives examples:
 - “Secrets should be accessible to authorized users only”
 - “Existence of repositories and services should be assured for exactly as long as client expectations;
- Security Targets.



ISM3 - Is protection successful?

- Business Objectives.
- Security Objectives.
- Security Targets examples.
 - “Less than 2 secrets revealed every year, accounting for less than 0.1% of the value of the company”
 - “Less than 10 invoices not claimed every year because of failed security objectives, accounting for less than 0.3% of the value of the company”



ISM3 - Continuous Improvement

- What you can't measure you can't manage.
- What you can't manage you can't improve.
- ISM3 uses PDCA per process & Metrics for continuous improvement.



ISM3 - Continuous Improvement

- Security Targets.

- Process Management Metrics:
 - Activity.
 - Coverage.
 - Update.
 - Availability.



ISM3 Compatibility & Process Orientation

- Process Oriented.
- ISM3 is compatible with ISO27001/BS7799, Cobit, ITIL and ISO9001.
- Organizations don't have to drop their current investment in ISM systems to adapt to ISM3.
- ISM3 has references to the best practices for performing each process.



ISM3 & BS7799 / ISO27001

- ISM3 can be used for a better BS7799 Implementation or alone.

- *Example for Patching of Critical Systems*

12.5.2 Technical review of applications after operating system changes:

When operating systems are changed, business critical applications shall be reviewed and tested to ensure there is no adverse impact on organizational operations or security.



ISM3 Guidance on Patching of Systems

Process	OSP-5 Environment Patching
Description	This process covers the on-going update of services to prevent incidents related to known weaknesses.
Rationale	Patching prevents incidents arising from the exploitation of known weaknesses in services.
Documentation	OSP-051-Services Update Level Report Template, OSP-052-Services Patching Management Procedure
Inputs	Inventory of Assets, Alerts and Fixes Report
Work Products	<i>Up to date services in every environment, Services Update Level Report.</i>
Activity	Number of Work Products submitted, Number of patching updates in information systems
Scope	Percentage of information systems covered by the process
Update	<p>Time since last Work Products submission</p> <p>Mean time between Work Products submissions</p> <p>Update level, calculated as follows:</p> <ol style="list-style-type: none"> 1. Every information system update level is equal to the sum of the number of days old that are all the security patches pending to apply. 2. The environment update level is equal to the sum of the individual update levels, divided by the number of information systems. <p>The lower this metric, the better. This metric allows checking of the progress of the patching process, and comparison of the update level of different environments.</p>
Availability	Percentage of time the patching systems are available

ISM3 Guidance (Explained)

Process	OSP-5 Environment Patching	ID
Description	This process covers the on-going update of services to prevent incidents related to known weaknesses.	WHAT
Rationale	Patching prevents incidents arising from the exploitation of known weaknesses in services.	WHY
Documentation	OSP-051-Services Update Level Report Template, OSP-052-Services Patching Management Procedure	DOCUMENTS
Inputs	Inventory of Assets, Alerts and Fixes Report	INPUTS
Work Products	<i>Up to date services in every environment, Services Update Level Report.</i>	RESULTS
Activity	Number of Work Products submitted, Number of patching updates in information systems	METRICS
Scope	Percentage of information systems covered by the process	METRICS
Update	<p>Time since last Work Products submission</p> <p>Mean time between Work Products submissions</p> <p>Update level, calculated as follows:</p> <ol style="list-style-type: none"> 1. Every information system update level is equal to the sum of the number of days old that are all the security patches pending to apply. 2. The environment update level is equal to the sum of the individual update levels, divided by the number of information systems. <p>The lower this metric, the better. This metric allows checking of the progress of the patching process, and comparison of the update level of different environments.</p>	METRICS
Availability	Percentage of time the patching systems are available	METRICS



ISM3 Responsibility Guidance

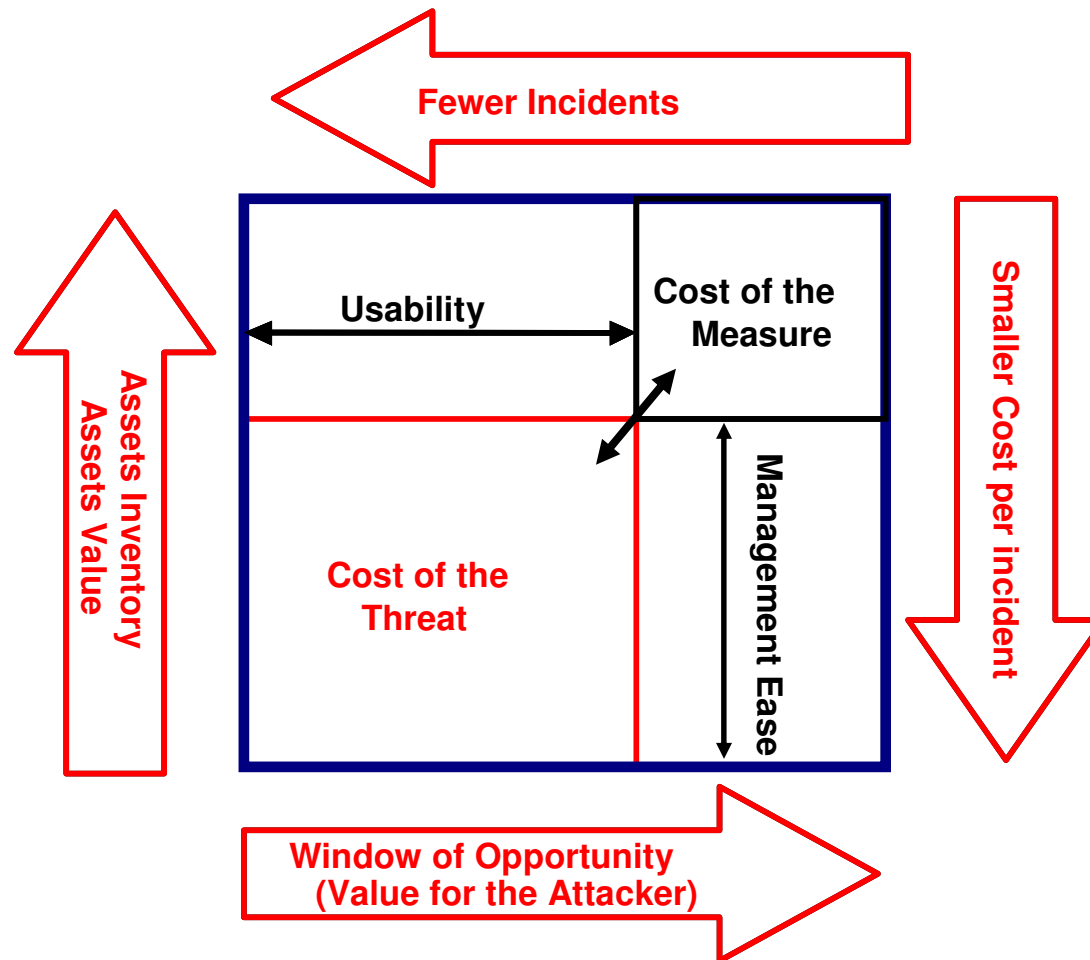
- **Transparency:** Responsibilities and reporting channels should be clearly defined, documented and communicated.
- **Partitioning:** All instances of ISM processes should have one and only one Process Owner.
- **Supervision:** All ISM processes should have at least one supervisor.
- **Rotation:** All sensitive processes should be transferred periodically to another competent process owner.
- **Separation:** No process owner will own incompatible processes.



ISM3 Flexibility

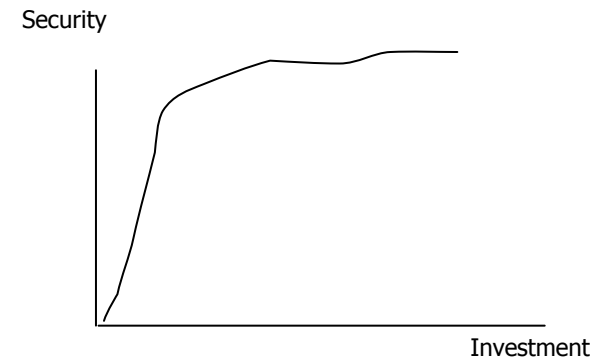
- ISM3 is adaptable to organizations with different missions and contexts.
- ISM3 is adaptable to organizations with different resources.
 - Security investment is driven by business need.
 - Some organizations may not have a huge budget for Information Security (20 / 80 Rule).
 - Maturity levels describe different levels of sophistication of ISM systems.
 - Organizations can identify appropriate processes, choose a level suitable for them, and show implementation progress.

The Security Compromise



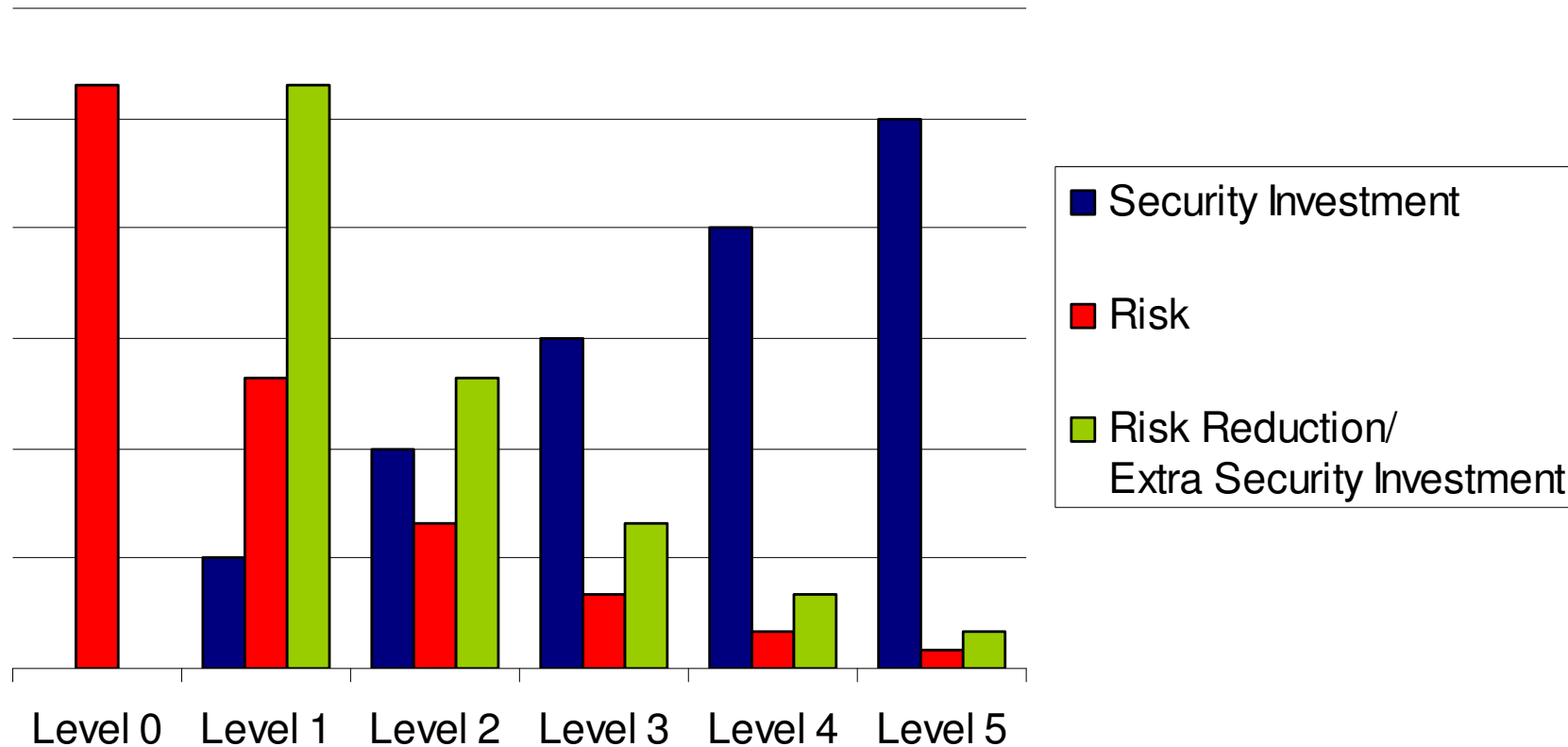
Security & Security Investment

- Mayfield's Paradox
 - It cost an infinite amount of money both to give everyone access to a system, and to prevent everyone access to the same system.
- CMU – CERT study:
 - The more you spend, the less difference it makes on your security.



ISM3 Maturity Levels

Security Investment & Risk



(Qualitative Graphic. Risk Reduction / Extra Security Investment, scaled x40 for readability)



ISM3 Maturity Levels (examples)

- **ISM3 Level 1** - Significant risk reduction from technical threats, for a minimum investment in essential ISM processes.
 - For organizations with low Information Security Targets in low risk environments.

- **ISM3 Level 3** - Highest risk reduction from technical threats, for a significant investment in Information Security processes.
 - For organizations with high Information Security Targets in normal or high-risk environments.

- **ISM3 Level 5** - Highest risk reduction from technical and internal threats, for a high and optimized investment in Information Security processes.
 - For organizations affected by specific requirements (such as utilities, and financial institutions) with high Information Security Targets in normal or high-risk environments.



Advantages of ISM3

- Maturity Levels make easier to prioritize and optimize investment in information security.
- ISO9001 compatible certifications; Some companies can't make big investments. It is well known that 20% of investment can give 80% of the results, but there is no way to show this. ISM3 levels 1 to 3 can help here.
- It scales to small and big organizations. The use of separate process in every environment prevents using procedures for restrictive environments all over the organization.



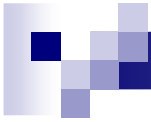
Advantages of ISM3

- It supports explicitly the outsourcing of security management and operations processes. The results for each process are defined and the responsibilities to perform each process are defined too.
- It provides work product metrics, that help to manage the processes and measure the success of the ISM system.
- It provides Information Security Governance guidance.



Summary

- Business Focused
- Manageable (with Metrics)
- Compatible (ITIL, ISO27001, ISO9001)
- Adaptable
- Flexible
- Open Standard, readily available
- Rich in implementation guidance



ISM3 Processes Overview



ISM3 Generic Goals

- Prevent and mitigate incidents that could jeopardize the organization's property and the output of products and services that rely on information systems;
- Optimise the use of information, money, people, time and infrastructure.



ISM3 Management Levels

- Strategic “hat” (Direct and Provide).
 - Security policies - objectives.
 - Resources.

- Tactical “hat” (Implement and Optimise).
 - ISM design.
 - Cultural change.

- Operational “hat” (Perform and Report).
 - Technical security processes.



ISM3 Strategic Goals

- Provides leadership and coordination of:
 - Information security;
 - Physical security;
 - Workplace security;
- Interaction with organizational units;
- Reviews and improves the information security management system;
- Defines relationships with other organisations;
- Provides resources for information security;
- Defines Security Objectives consistent with organizational objectives, protecting stakeholders interests;
- Sets the organizational scheme of delegation (TPSRSR).



ISM3 Tactical Goals

- Provide feedback to Strategic Management;
- Define the environment for Operational Management.
- Define Security Targets;
- Define efficacy and efficiency metrics;
- Define information classes, priorities, durability and quality groups;
- Define environments and lifecycles;
- Select appropriate processes to achieve the Security Targets;
- Manage budget, people and other resources allocated to information security



ISM3 Operational Goals

- Provide feedback to Tactical Management;
- Identify and protect assets;
- Protection and support of information systems throughout their lifecycle;
- Management of the security measures lifecycle;
- Apply allocated resources efficiently and effectively;
- Carry out processes for incident prevention, detection and mitigation (both real time and following an incident).



ISM3 Level 1

- SSP-1 Report to Stakeholders.
 - SSP-2 Coordination.
 - SSP-3 Strategic vision.
 - SSP-6 Allocate resources for information security.
-
- TSP-1 Report to strategic management.
 - TSP-2 Manage allocated resources.
 - TSP-3 Define Security Targets.
 - TSP-12 Select Specific Processes.



ISM3 Level 1

- Management
 - OSP-1 Report to tactical management.
- Information Systems
 - OSP-5 Environment Patching.
- Security Measures
 - OSP-10 Backup & Redundancy Management.
 - OSP-16 Segmentation and Filtering Management.
 - OSP-17 Malware Protection Management.



ISM3 Level 2 = Level 1+

- TSP-5 Define Properties Groups.
- TSP-6 Define environments and lifecycles.
- TSP-10 Disciplinary Process.
- TSP-11 Security Awareness.
- Management
 - OSP-2 Select tools for implementing security measures.
- Information Systems
 - OSP-4 Information Systems Environment Change Control.
 - OSP-6 Environment Clearing.
 - OSP-7 Environment Hardening.



ISM3 Level 2 = Level 1+

- Security Measures
 - OSP-9 Security Measures Change Control.
 - OSP-11 Access control over services, repositories channels and interfaces.
 - OSP-12 User Registration.
 - OSP-14 Physical Environment Protection Management.
- Test
 - OSP-19 Attacks, Errors and Accidents Emulation.
- Monitor
 - OSP-22 Alerts Monitoring.



ISM3 Level 3 = Level 2+

- TSP-4 Define metrics for security processes
- TSP-9 Security Personnel Training
- Management
 - OSP-3 Inventory Management.
- Information Systems
 - OSP-8 Software Development Lifecycle Control
- Security Measures
 - OSP-13 Encryption Management
 - OSP-15 Operations Continuity Management
- Test
 - OSP-20 Incident Emulation.
- Incident Handling
 - OSP-24 Handling of incidents and near-incidents.



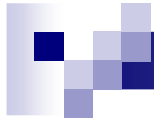
ISM3 Level 4 = Level 3+

- SSP-4 Define rules for the division of duties: transparency, partitioning, supervision, rotation and separation of responsibilities (TPSRSR).
- SSP-5 Check compliance with TPSRSR rules.
- TSP-7 Background Checks
- TSP-8 Security Personnel Selection
- Security Measures
 - OSP-18 Insurance Management
- Monitor
 - OSP-23 Events Detection and Analysis.
- Incident Handling
 - OSP-25 Forensics



ISM3 Level 5 = Level 4+Metrics

- The following metrics are compulsory:
 - Activity
 - Update
 - Coverage
 - Availability



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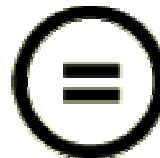
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