

Study of the certification impact

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Introduction Inovaria

Inova-Ria - Companies Association for an Innovation Network, was established in 2003, although the people and organizations that directly or indirectly contributed to its creation are linked to the Portugal's telecommunications history since the 50's.

The so-called "Aveiro's Telecommunication Cluster" has been built from all those years and confirmed the starting existence of unique entrepreneurial ecosystem in the early 2000's. It is characterized by new technology development, innovation and research practice, as proved by the tangible results achieved by small and large companies.

A group of companies created Inova-Ria with primarily objective to establish an articulated strategy to bring the region to a european reference in Information, Communication Technologies and Electronics, assuming itself as a gateway to a valuable network.

Inova-Ria - Companies Association for an Innovation Network, is a non-profit organization in Aveiro, Portugal, that aims to create and strengthen an Information & Communication Technologies and Electronics Cluster.

Inova-Ria is crucial to the innovation ecosystem formed by companies, universities and research and development institutions in those technologies and currently plays an active role promoting and building collaborative efforts.

This association has been recognized as the Portugal's Center Region entity that connects a valuable set of intensive technology companies, start-ups, small and medium enterprises and also some large companies. This diversity has a high potential for creativity and enterprise competitiveness, mostly because through this "Innovation Network" it's possible to build up collaborative strategies that add more value to





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businesses. The younger companies have been assuming a leading role as changing forces through the creation of novel products, services and innovative business models, thereby contributing to our rejuvenation.

In 10 years, this association have grown and evolved, playing an active role in promoting and creating value in the sector, particularly through research and development, new technologies dissemination, knowledge and people scouting, international business experiences and, above all, the creation of new technological based companies. All of this achievements are possible working as a network, promoting collaborative strategies that increase value, inspire creativity and give competitiveness to all businesses.

With almost 70 associated members, Inova-Ria wants to growth the network by attracting companies of all sectors in the order to enhance the complementarity in the network.

Together we are stronger.

Mission

Contribute to the recognition of the region as the TICE center of the country

Vision

Encourage the development of TICE and a business opportunities for its members, across the creation and dynamization of collaborative networks between partners.





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Goals

The Association aims to create and consolidate a cluster in the area of Information Technology, Communication and Electronics, with a special focus on telecommunications, centered in the Region of Aveiro.

The Association's objectives are:

- a) contribute to the creation and consolidation of a cluster in the area of Telecommunications centered in the Region of Aveiro;
- b) contribute to the creation and sustainability of qualified employment in the Region of Aveiro;
- c) promote innovation in the area of Information Technology, Communication and Electronics, with special focus in Telecommunications;
- d) promote commercial cooperation, particularly in the areas of research and development, qualification, marketing and internationalization;
- e) provide services to associated enterprises contributing to their development and competitiveness;



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About study leaders

Associate Professor | FEUP



Associate Professor in Software Engineering at the Faculty of Engineering of the **University of Porto**.

President of the Sectoral Commission for the Quality of Information and Communications Technology (CS/03) in the scope of the Portuguese Quality Institute.

More than 25 years of experience in **education, research, development and consultancy in several software engineering areas.**

Interests/Specialities: software testing, software process improvement, model-driven engineering.

Invited Professor | FEUP & Strongstep | CEO and Co- Founder

Worked in 10 countries in Europe and Africa in process, tools and organization improvement in software development & services.



More than 19 years of experience, including consulting in software engineer; Telecom, health and education sector – Ericsson Sweden, Aerospace France, Altran Portugal

Professor at the master in engineering, services and management at Porto University.



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Hobbies & Activities: travel, inline-skating, snowboarding, meeting new cultures & people, loves new challenges!

Spoke at Tedxporto “**Dreams – The innovators best friend**”

Growing international competitiveness

Why is increasing international competitiveness increasingly evident? Because:

- Development of software solutions and services can be extremely complex
- Quality is now a requirement, not an extra
- Software customers want to pay less and less for their software
- More and more companies outsource – offshore and nearshore
- Geographical dispersion brings new cultural challenges

Certification: why?

Can It bring us more profit?

- Accomplish schedule
- Accomplish budget
- Guarantee Quality

Can it help companies go international?

- Access to new market
- Larger scale projects



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Implementation Impact

Area	Improvement Average Value
Costs	20%
Deadlines	37%
Productivity	67%
Quality	50%
Quality Satisfaction	14%
Return of Investment (ROI)	4.8 : 1

Summary of the performance of 25 organizations when CMMI model (the most renowned model for software development processes improvement) was implemented.

Source: SEI – Software Engineering Institute

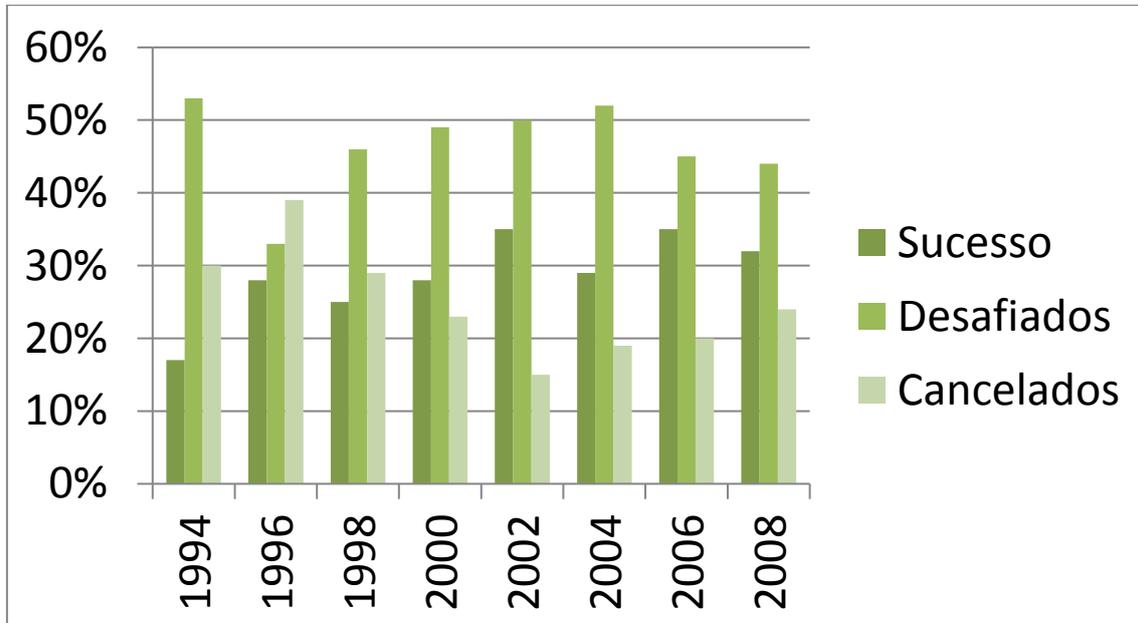
When there are no (good) processes?

Bellow some problems that companies can face if they don't have any kind of processes:

- No guarantee that best practices are being followed
- Largely dependent on the human factor - risk of an inefficient execution by inexperienced people
- No responsibility for those not following the standards
- Risk of important project issues are not being escalated to higher management



Success in IT projects



Source: Chaos Report

- 44% Challenged projects
- 22% Cancelled projects

“The quality of a software system is governed by the quality of the process used to develop and evolve it.” **Watts Humphrey**



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CMMI Maturity Model

Companies & certifications

Company	Certification obtained
Ubiwhere Lda	CMMI-SVC L3
Advancingto Lda	NP EN ISO 9001:2015
ITSector	CMMI level 2
Micro I/O - Serviços de Electrónica, Lda	CMMI DEV2
SHAR SA (ITCenter)	ISO 9001: 2015
XPAND IT	CMMI Dev nível 2
BDSO - Soluções de Bidescontaminação Lda.	NP EN ISO 9001:2015
Finantech	IT Mark
Globaltronic, S.A.	ITMark
Sysmatch - Consultores De Sistemas De Informação, Lda.	ISO 9001

What certifications?

These certifications were implemented in the companies that are part of this study:

- ISO9001 – Basic Quality Management System
- CMMI DEV – Software Development maturity model
- CMMI SRV – Services maturity model
- ITMARK – SMB Software Development + security + Business development maturity model

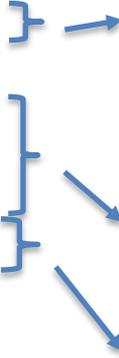


Impact of Actor3

ACTOR3 impact in the growth of companies:

Improvement indicator	Average evaluation
Internal Organization	4.20
Quality of Deliver increase	4.00
Productivity	3.80
Reduction of errors in production	3.70
Client satisfaction	3.70
Capacity to adapt to changes	3.60
Cost reductions	3.10

Scale
5-Great improvement
4-Significant improvement
3-same
2-worse slightly
1-much worse



In short term, companies felt an improvement in the internal organization, and an improvement of the quality of delivery.

There is already an improvement in mid-term impact factors, in the reduction of errors in production, client satisfaction and productivity.

Regarding cost reductions, there is a neutral evaluation, possibly because the short term investments in certifications will take some time to generate cost reductions.

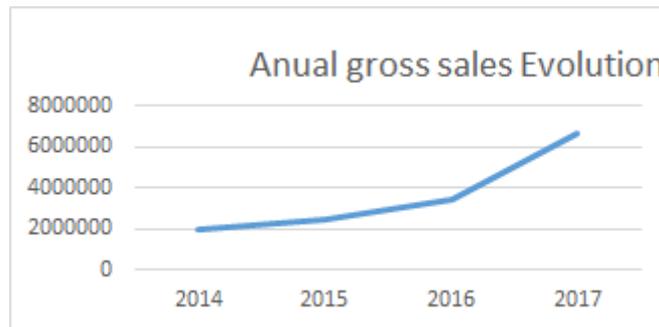
Business impact in participating organizations

Companies in this study showed a 21% average growth and a 157% growth in exports (sales to international markets - Period from 2014 to 2016).



Conclusions of the economical impact

Certification are enabler for growth, due to: better internal organization, better quality of delivery and higher productivity.





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ANEXOS

ANNEX 1 - About CMMI development

Context

- Nowadays develop and manage software is an extremely complex challenge;
- It is necessary to assure quality but at the same time maintain competitive prices;
- Software and its services are vital for most companies and businesses;
- Lack of quality in software costs time and money either in development phases or operation phases of software;

The quality of a software

“The quality of a software system is governed by the quality of the process used to develop and evolve it.”- **Watts Humphrey**

CMMI

- **CMMI stands for :**
Capability Maturity Model Integration
- It's current version is 1.3
- The model was created by the SEI (Software Engineering Institute from the Carnegie Mellon University) and it's run by the CMMI Institute
- Processes and continuous improvement methodology for an organization





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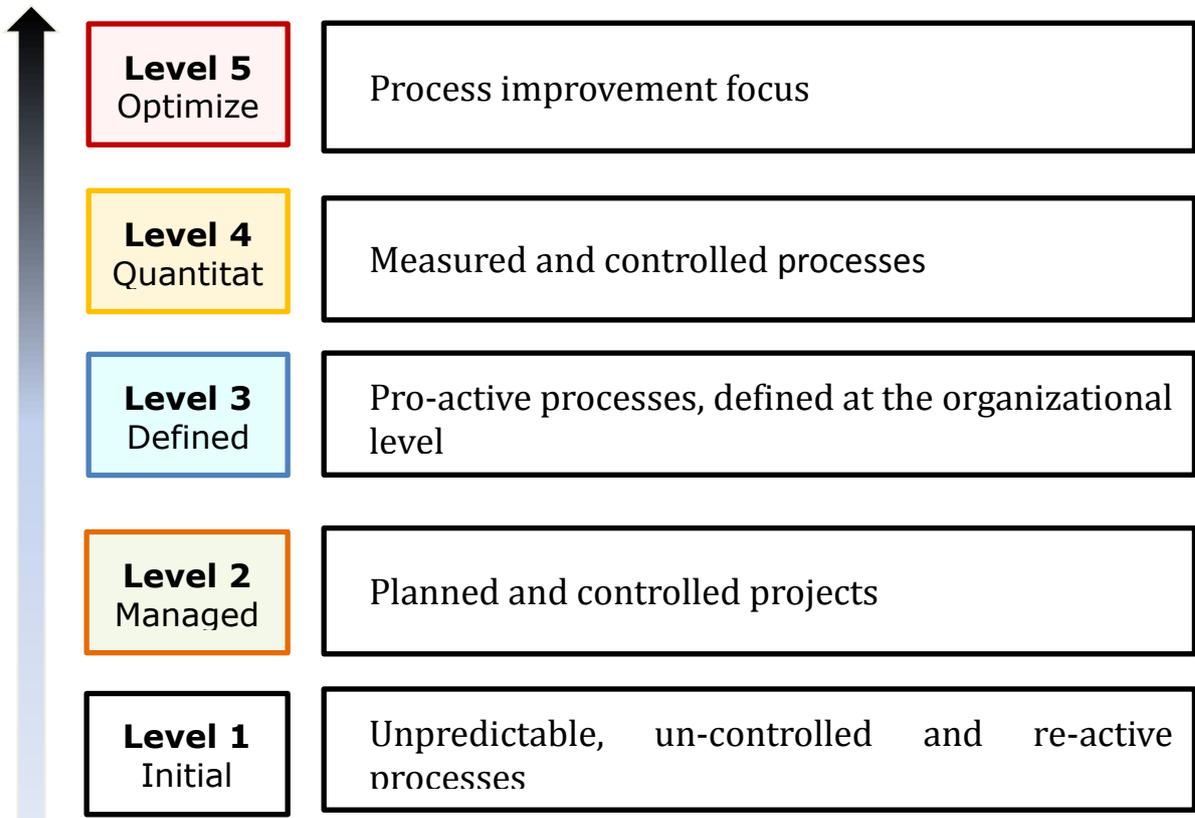
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CMMI Constellations



5 Maturity Levels



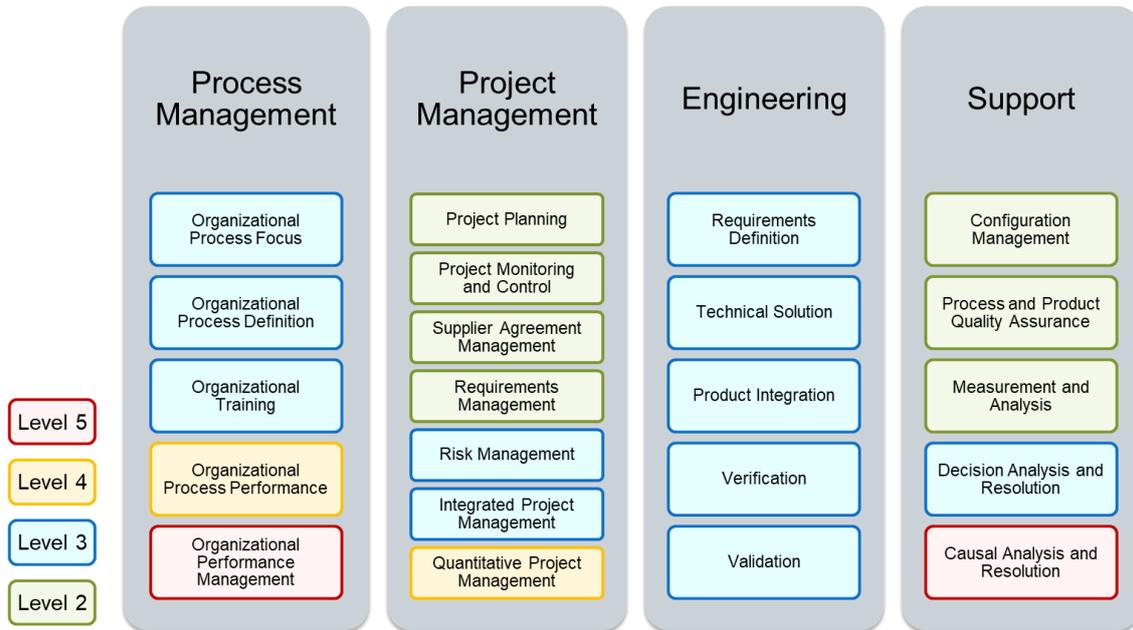


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22 Process areas



Some CMMI benefits

- Process alignment with business goals
- Better requirements management - help ensure product and service expectations
- CMMI will help you improve your estimations accuracy
- Less rework – more time for innovation
- Help reduce costs
- CMMI can be used as a competitive advantage towards other less mature organizations

The challenges

- Change!
- Keep the organization running and making money (business as usual)
- Model knowledge and it's interpretation – practical experience
- Motivate people!



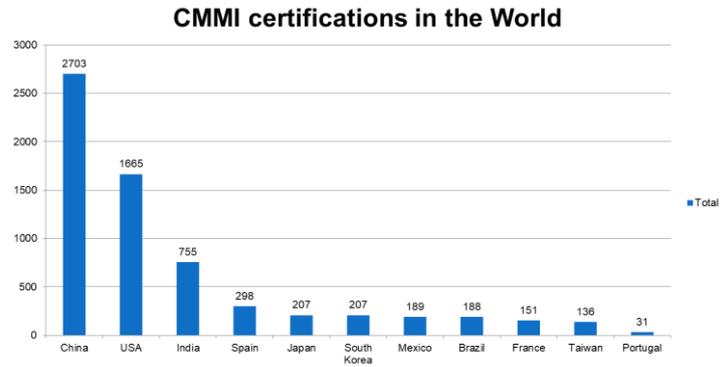
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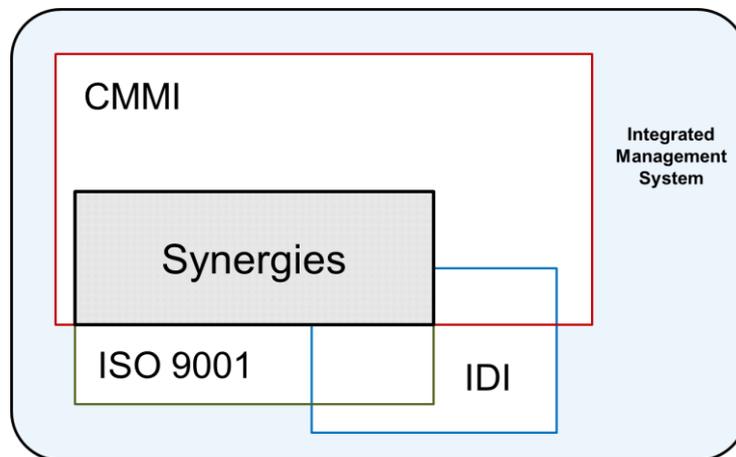


CMNI Instituto Software Engineering Institute

CMMI in the World



CMMI, 9001, IDI



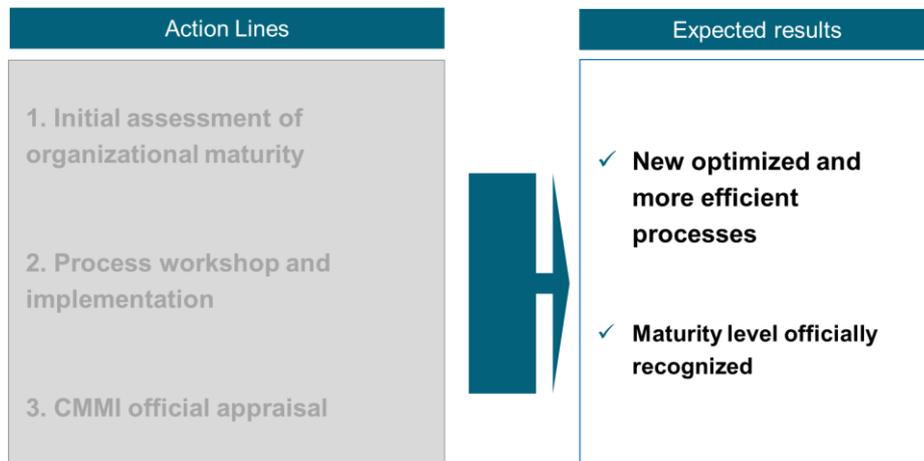
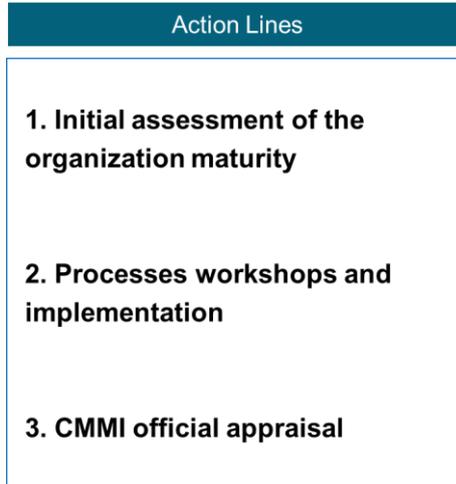


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Scope





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Critical Success Factors



**Strong
Sponsorship**



**Open
Communication**



**Involvement
and
participation**



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ANNEX 2 - CMMI Services

Service Economy

Service portion of worldwide economy is 80%, also 80% in US

Service sector is Portugal's largest employer, with 3 of 5 working in service, and 75% of total GDP.

Service challenges and opportunities:

- mismatch of labor and education
- mobile broadband is huge, with little room left for growth; superior service may become the discriminator
- national reform plan calls for competition within service industry

Success story: Portugal was one of least friendly countries to start a business, now one of the best; achieved by a focus on process improvement.



How Do Services Differ from Other Products?

- A **service** is an intangible, non-storable product (e.g., operations, maintenance, logistics, and IT).
- Services imply on-going relationships governed by **service (level) agreements**.
- Services are delivered through the operation of a **service system**.
- Services are simultaneously produced and consumed.
- Services have a different business rhythm.



The CMMI Models

- The CMMI Product Suite currently has three models relevant to improvement in a particular area of interest.
- Development (CMMI-DEV)
 - **build** stuff
 - tangible, storable products made to specification in a lifecycle
- Acquisition (CMMI-ACQ)
 - **buy** stuff
 - specify, solicit, select, contract, procure, accept, transition to consumer
- Services (CMMI-SVC)
 - **do** stuff
 - intangible, non-storable products delivered via a service system based on explicit or implicit service requests



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CMII Institute Software Engineering Institute

What is the CMMI for Services?

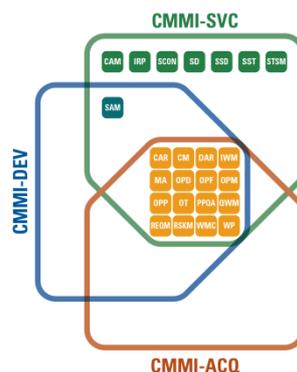
CMMI-SVC guides all types of service providers to establish, manage, and improve services to meet business goals.

Like every CMMI model, CMMI-SVC :

- helps to set process improvement goals and priorities, provide guidance for quality processes, and provide a point of reference for appraising current processes
- can be applied internally or externally
- works well with other frameworks
- represents the consensus of thousands of practitioners about the essential elements of service delivery
- can be used in whole or in part

What types of services does CMMI-SVC cover?

Relationships Among CMMI Models





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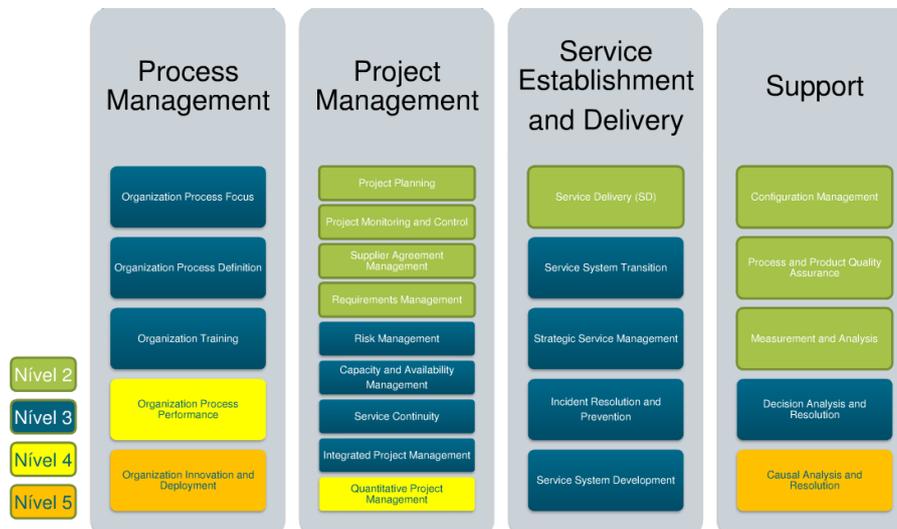
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Service Specific Process Areas

Process Area	Maturity Level	Category	Specific Goals/ Specific Practices
Capacity and Availability Management (CAM)	3	Project Management	2 / 6
Incident Resolution and Prevention (IRP)	3	Service Establishment and Delivery	3 / 11
Service Continuity (SCON)	3	Project Management	3 / 8
Service Delivery (SD)	2	Service Establishment and Delivery	3 / 8
Service System Development (SSD) *	3	Service Establishment and Delivery	3 / 11
Service System Transition (SST)	3	Service Establishment and Delivery	2 / 5
Strategic Service Management (STSM)	3	Service Establishment and Delivery	2 / 4

Process Areas by Category and ML





Service Delivery (SD)

The purpose of Service Delivery (SD) is to deliver services in accordance with service agreements.

SG 1 Establish Service Agreements

- SP 1.1 Analyze Existing Agreements and Service Data
- SP 1.2 Establish the Service Agreement

SG 2 Prepare for Service Delivery

- SP 2.1 Establish the Service Delivery Approach
- SP 2.2 Prepare for Service System Operations
- SP 2.3 Establish a Request Management System

SG 3 Deliver Services

- SP 3.1 Receive and Process Service Requests
- SP 3.2 Operate the Service System
- SP 3.3 Maintain the Service System

Incident Resolution and Prevention (IRP)

The purpose of Incident Resolution and Prevention (IRP) is to ensure timely and effective resolution of service incidents and prevention of service incidents as appropriate.

SG 1 Prepare for Incident Resolution and Prevention

- SP 1.1 Establish an Approach to Incident Resolution and Prevention
- SP 1.2 Establish an Incident Management System

SG 2 Identify, Control, and Address Individual Incidents

- SP 2.1 Identify and Record Incidents
- SP 2.2 Analyze Individual Incident Data
- SP 2.3 Resolve Incidents
- SP 2.4 Monitor the Status of Incidents to Closure
- SP 2.5 Communicate the Status of Incidents

SG 3 Analyze and Address Causes and Impacts of Selected Incidents

- SP 3.1 Analyze Selected Incidents
- SP 3.2 Establish Solutions to Respond to Future Incidents
- SP 3.3 Establish and Apply Solutions to Reduce Incident Occurrence



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Capacity and Availability Management (CAM)

The purpose of Capacity and Availability Management (CAM) is to ensure effective service system performance and ensure that resources are provided and used effectively to support service requirements.

SG 1 Prepare for Capacity and Availability Management

- SP 1.1 Establish a Capacity and Availability Management Strategy
- SP 1.2 Select Measures and Analytic Techniques
- SP 1.3 Establish Service System Representations

SG 2 Monitor and Analyze Capacity and Availability

- SP 2.1 Monitor and Analyze Capacity
- SP 2.2 Monitor and Analyze Availability
- SP 2.3 Report Capacity and Availability Management Data

Service System Development (SSD)

The purpose of Service System Development (SSD) is to analyze, design, develop, integrate, verify, and validate service systems, including service system components, to satisfy existing or anticipated service agreements.



SG 1 Develop and Analyze Stakeholder Requirements

- SP 1.1 Develop Stakeholder Requirements
- SP 1.2 Develop Service System Requirements
- SP 1.3 Analyze and Validate Requirements

SG 2 Develop Service Systems

- SP 2.1 Select Service System Solutions
- SP 2.2 Develop the Design
- SP 2.3 Ensure Interface Compatibility
- SP 2.4 Implement the Service System Design
- SP 2.5 Integrate Service System Components

SG 3 Verify and Validate Service Systems

- SP 3.1 Prepare for Verification and Validation
- SP 3.2 Perform Peer Reviews
- SP 3.3 Verify Selected Service System Components
- SP 3.4 Validate the Service System

Service System Transition (SST)

The purpose of Service System Transition (SST) is to deploy new or significantly changed service system components while managing their effect on ongoing service delivery.

SG 1 Prepare for Service System Transition

- SP 1.1 Analyze Service System Transition Needs
- SP 1.2 Develop Service System Transition Plans
- SP 1.3 Prepare Stakeholders for Changes

SG 2 Deploy the Service System

- SP 2.1 Deploy Service System Components
- SP 2.2 Assess and Control the Impacts of the Transition

Service Continuity (SCON)

The purpose of Service Continuity (SCON) is to establish and maintain plans to ensure continuity of services during and following any significant disruption of normal operations.



SG 1 Identify Essential Service Dependencies

- SP 1.1 Identify and Prioritize Essential Functions
- SP 1.2 Identify and Prioritize Essential Resources

SG 2 Prepare for Service Continuity

- SP 2.1 Establish Service Continuity Plans
- SP 2.2 Establish Service Continuity Training
- SP 2.3 Provide and Evaluate Service Continuity Training

SG 3 Verify and Validate the Service Continuity Plan

- SP 3.1 Prepare for the Verification and Validation of the Service Continuity Plan
- SP 3.2 Verify and Validate the Service Continuity Plan
- SP 3.3 Analyze Results of Verification and Validation of the Service Continuity Plan

Strategic Service Management (STSM)

The purpose of Strategic Service Management (STSM) is to establish and maintain standard services in concert with strategic needs and plans.

SG 1 Establish Strategic Needs and Plans for Standard Services

- SP 1.1 Gather and Analyze Data
- SP 1.2 Establish Plans for Standard Services

SG 2 Establish Standard Services

- SP 2.1 Establish Properties of Standard Services and Service Levels
- SP 2.2 Establish Descriptions of Standard Services

Vocabulary

Service: A product that is intangible and non-storable.

Services are delivered through the use of service systems that have been designed to satisfy service requirements.

Many service providers deliver combinations of services and goods. A single service system can deliver both types of products. For example, a training organization can deliver training materials along with its training services.

Services may be delivered through combinations of manual and automated processes.



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Service agreement: A binding, written record of a promised exchange of value between a service provider and a customer.

Service agreements can be fully negotiable, partially negotiable, or non-negotiable, and they can be drafted either by the service provider, the customer, or both, depending on the situation.

A “promised exchange of value” means a joint recognition and acceptance of what each party will provide to the other to satisfy the agreement. Typically, the customer provides payment in return for delivered services, but other arrangements are possible.

A “written” record need not be contained in a single document or other artifact. Alternatively, it may be extremely brief for some types of services (e.g., a receipt that identifies a service, its price, its recipient).

Service level agreement : A service agreement that specifies delivered services; service measures; levels of acceptable and unacceptable services; and expected responsibilities, liabilities, and actions of both the provider and customer in anticipated situations.

A service level agreement is a kind of service agreement that documents the details indicated in the definition.

The use of the term “service agreement” always includes “service level agreement” as a subcategory and the former may be used in place of the latter for brevity. However, “service level agreement” is the preferred term when it is desired to emphasize situations in which distinct levels of acceptable services exist, or other details of a service level agreement are likely to be important to the discussion.

Service System: An integrated and interdependent combination of component resources that satisfies service requirements.

A service system encompasses *everything* required for service delivery, including work products, processes, facilities, tools, consumables, and human resources.

Note that a service system includes the people necessary to perform the service system’s processes. In contexts where end users perform some processes for service delivery to be accomplished, those end users are also part of the service system (at least for the duration of those interactions).



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A complex service system may be divisible into multiple distinct delivery and support systems or subsystems. While these divisions and distinctions may be significant to the service provider organization, they may not be as meaningful to other stakeholders.





ANNEX 3 – ISO27001

Iso 27001: Overview and Requirements for Information Security Management Systems

Motivation

Organizations of all types and sizes collect, process, store and transmit **information** in many forms. This information is **valuable** to an organization’s business and operations.

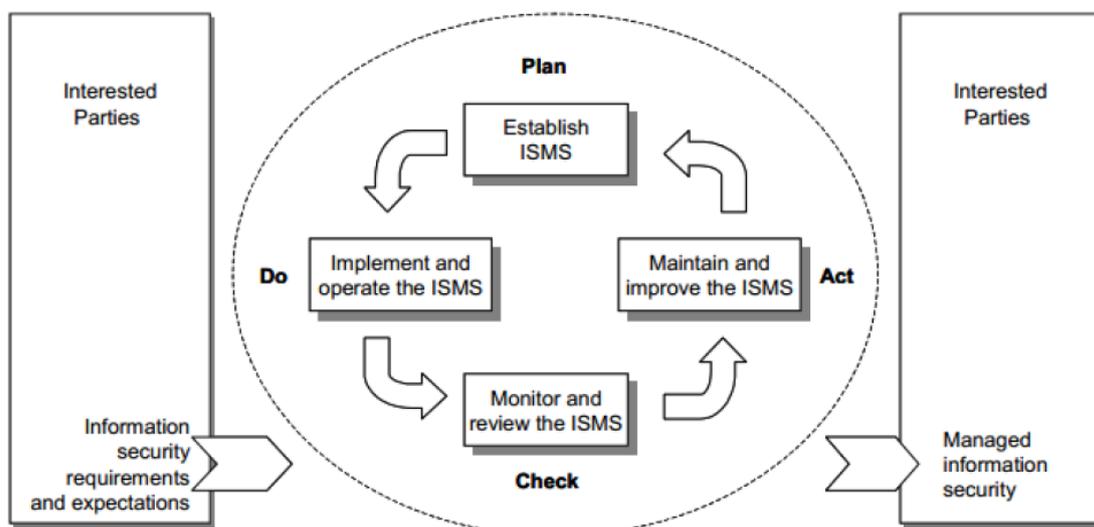
In today’s interconnected and mobile world, information is processed using systems and networks that employ state-of-the-art technology. It is vital to **protect** this information against both deliberate and accidental **threats** and **vulnerabilities**.

ISO/IEC 27001 helps organizations to keep **secure** both **their information assets** and those of their **customers**.

What is ISO/IEC 27001?

The **ISO/IEC 27001:2013** standard provides **requirements** for establishing, implementing, maintaining and continually improving an **information security management system (ISMS)**.

It can be used by internal and external parties to assess the organization’s ability to meet the organization’s own information security requirements.





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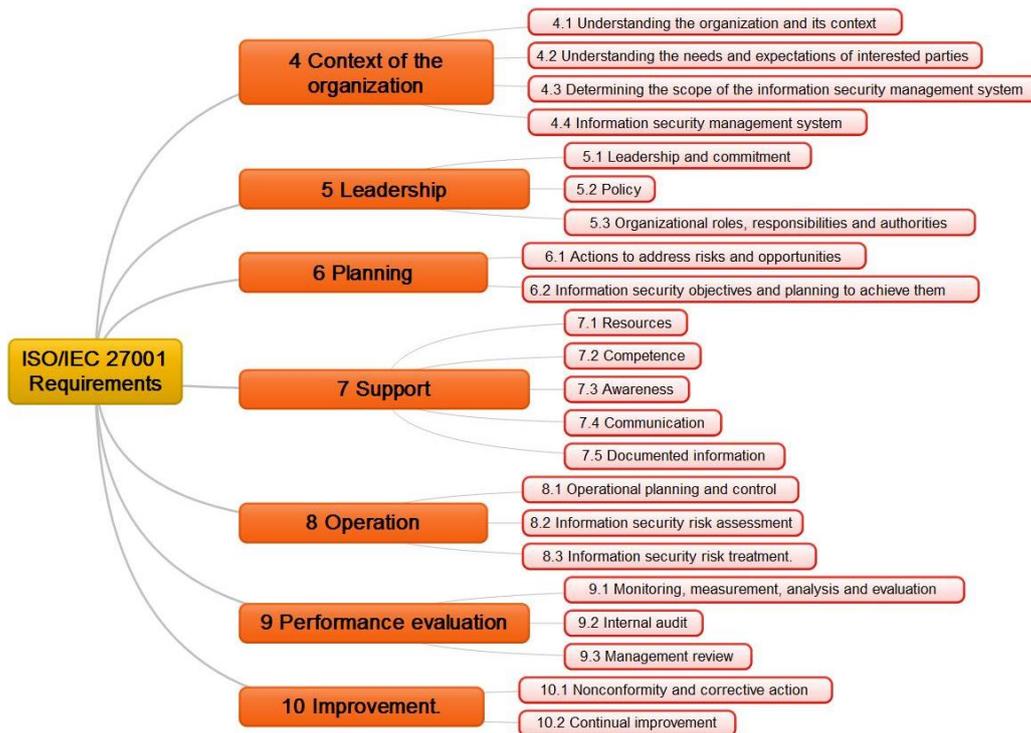
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Mandatory Requirements for ISMS

“Excluding any of the requirements specified in Clauses 4 to 10 is not acceptable when an organization claims conformity to this International Standard.”



Mandatory Requirements Example

4.2 Understanding the needs and expectations of interested parties

The organization shall determine:

- interested parties that are relevant to the information security management system; and
- the requirements of these interested parties relevant to information security.

NOTE The requirements of interested parties may include legal and regulatory requirements and contractual obligations.



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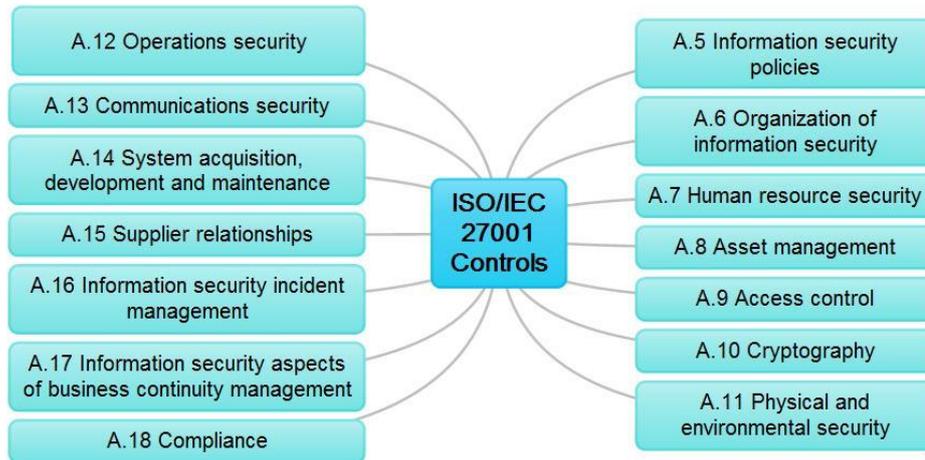


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Discretionary Requirements for ISMS



Discretionary Requirements Example

A.8 Asset management		
A.8.1 Responsibility for assets		
Objective: To identify organizational assets and define appropriate protection responsibilities.		
A.8.1.1	Inventory of assets	<i>Control</i> Assets associated with information and information processing facilities shall be identified and an inventory of these assets shall be drawn up and maintained.
A.8.1.2	Ownership of assets	<i>Control</i> Assets maintained in the inventory shall be owned.
A.8.1.3	Acceptable use of assets	<i>Control</i> Rules for the acceptable use of information and of assets associated with information and information processing facilities shall be identified, documented and implemented.
A.8.1.4	Return of assets	<i>Control</i> All employees and external party users shall return all of the organizational assets in their possession upon termination of their employment, contract or agreement.



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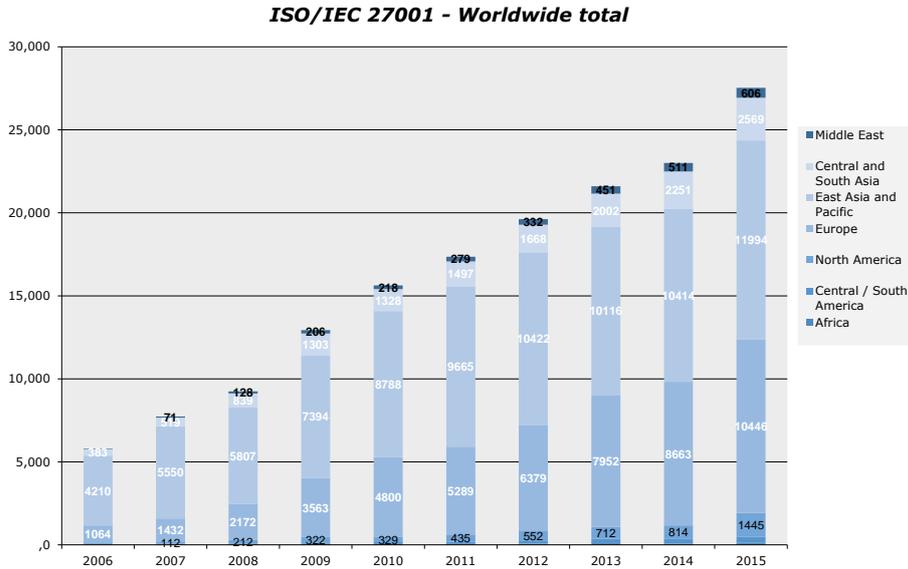
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Innovation in software quality

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ISO/IEC 27001 Certificates Worldwide



Top 10 countries for ISO/IEC 27001 certificates - 2015

1	Japan	8240
2	United Kingdom	2790
3	India	2490
4	China	2469
5	United States of America	1247
6	Romania	1078
7	Italy	1013
8	Germany	994
9	Taipei, Chinese	939
10	Spain	676
...
40	Portugal	56

Source: ISO Survey





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Registrations at IPAC in Portugal

Entidade	Norma	Distrito
ANAFRE – Associação Nacional de Freguesias	NP ISO/IEC 27001:2013	Lisboa
ONITELECOM - INFOCOMUNICAÇÕES, S.A.	NP ISO/IEC 27001:2013	Lisboa
ANO - Sistemas de Informatica e Servicos, Lda.	ISO/IEC 27001:2013	Porto
Ar Telecom - Acessos e Redes de Telecomunicações, S.A.	ISO/IEC 27001:2013	Lisboa
Associação DNS.PT	ISO/IEC 27001:2013	Lisboa
AUTO RIBEIRO, LDA	ISO/IEC 27001:2013	Porto
BLUETREND TECHNOLOGIES, LDA	ISO/IEC 27001:2013	Coimbra
Câmara Municipal de Águeda	ISO/IEC 27001:2013	Aveiro
COMPTA – Infraestruturas e Segurança, S.A	ISO/IEC 27001:2013	Porto
CONSTRULINK - Tecnologias de Informacao, S.A.	ISO/IEC 27001:2013	Lisboa
Divisão de Informática e Sistemas de Informação dos Serviços Intermunicipalizados de Água e Saneamento dos Municípios de Oeiras e Amadora	ISO/IEC 27001:2013	Lisboa
InCentea - Tecnologias de Gestão, S.A.;	ISO/IEC 27001:2013	Leiria
INFORMANTEM - INFORMÁTICA E MANUTENÇÃO, S.A.	ISO/IEC 27001:2013	Lisboa
IP TELECOM, SERVIÇOS DE TELECOMUNICAÇÕES S.A.	ISO/IEC 27001:2013	Lisboa
MAILTEC COMUNICAÇÃO, S.A.	ISO/IEC 27001:2013	Lisboa
PAPERSOFT S.A.	ISO/IEC 27001:2013	Setúbal
PetriDish Software, Lda.	ISO/IEC 27001:2013	Porto
RECONFINANCE - GESTÃO E RECUPERAÇÃO DE ACTIVOS, S.A.	ISO/IEC 27001:2013	Porto
ACIN-ICLOUD SOLUTIONS, LDA	ISO/IEC 27001:2005	Funchal
DIGITALSIGN - CERTIFICADORA DIGITAL SA	ISO/IEC 27001:2005	Braga

ISO/IEC 27001 Benefits

Best framework for complying with information security legal, regulatory and contractual requirements

Better organizational image because of the certificate issued by a certification body

Proves that senior management are committed to the security of the organization, including customer's information

Focused on reducing the risks for information that is valuable for the organization

Provides a common goal

Optimized operations within the organization because of clearly defined responsibilities and business processes





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ANNEX 4 - It MARK

More than 90% of the world IT market is made up of SMEs.

It is much more than a certification It is Trademark of European Software Institute since 2005.

A recognition for SMEs: commitment to quality.

An improvement of competitiveness: attitude of continuous improvement.

A way to stand out from the market.

A positioning with real and potential customers: quality oriented towards 0 defects.

Timeframe adapted to SME, providing motivational steps along the way ...



Business Management

Based on 10² (Ten Squared) tool and EFQM quality excellence model.

The assessment is carried out based on best practices in the industry (benchmarking)

Useful for software organisations

Helps managers identify key business elements to consider

Quick overview of key business processes: strategic, commercial, financial, marketing





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Information Security Management

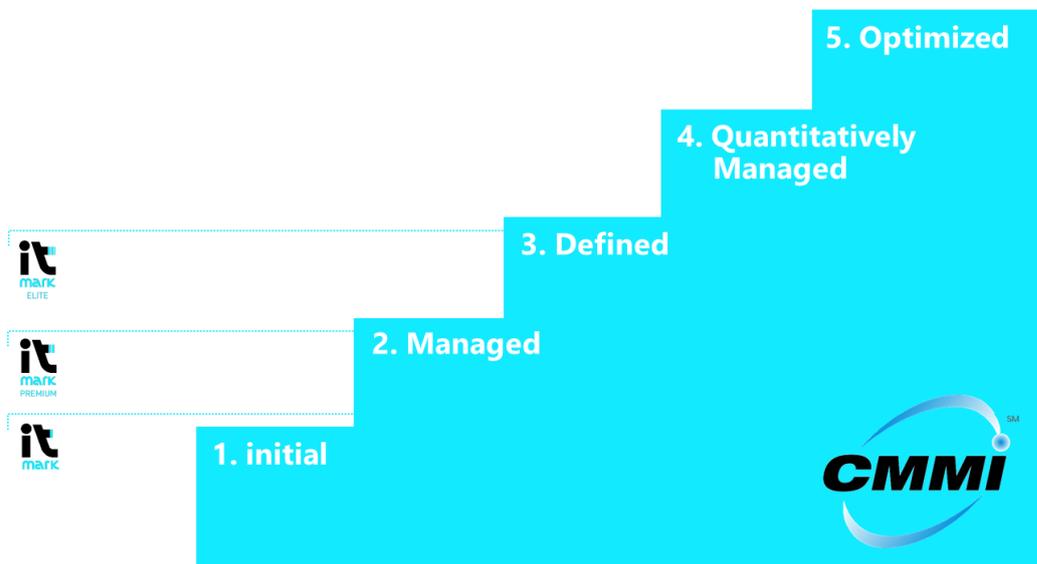
Based on ISO/IEC 27002

Recommendations for information security management

Provides a common framework for:

- The development of security standards in organisations
- The development of effective practices in security management
- Providing confidence in inter-organisational supplies

Software and Systems Processes





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IT Mark integrates

3 aspects of organization processes in 1 single investment !

Good Starting Point:

Continue with IT Mark

Continue with other models (CMMI, Ten-Squared, ISO)

IT Mark Levels

IT Mark: accredits a company which is aware of the issues related to Technical, Security and Business management, and has already taken steps to control them.

IT Mark *Premium* : accredits a company which has achieved Good Business, Security and Software development capability, according to world-class models.

IT Mark *Elite* : accredits a company which has achieved a High level of Definition and Institutionalization of its Business, Security and Technical development capability, so that the quality of their products is expected to be good due to their mature Continuous Improvement Processes.

More than 200 companies certified in 30 countries* ...





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Based on internationally recognised models, with solid and affordable assessment methodology ...



10²

ISO 27000

79% of the companies have improved their competitiveness more than 20%.

89% of the companies have improved their business processes more than 30%.

81% of the companies have increased their customer's satisfaction.

60% of the companies have reduced their delivery time between 20% and 50%.



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ANNEX 5 - ISO 9001

WHAT IS ISO 9001:2015 – QUALITY MANAGEMENT SYSTEMS?

ISO 9001 is the international standard that specifies requirements for a quality management system (QMS). Organizations use the standard to demonstrate the ability to consistently provide products and services that meet customer and regulatory requirements. It is the most popular standard in the ISO 9000 series and the only standard in the series to which organizations can certify.

ISO 9001 was first published in 1987 by the International Organization for Standardization (ISO), an international agency composed of the national standards bodies of more than 160 countries. The current version of ISO 9001 was released in September 2015.



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Who should use the ISO 9001:2015 – quality management systems revision?

ISO 9001:2015 applies to any organization, regardless of size or industry. More than one million organizations from more than 160 countries have applied the ISO 9001 standard requirements to their quality management systems.

Organizations of all types and sizes find that using the ISO 9001 standard helps them:

Organize processes

Improve the efficiency of processes

Continually improve

All organizations that use ISO 9001 are encouraged to transition to ISO 9001:2015 as soon as possible. This includes not only organizations that are certified to ISO 9001:2008, but also any organizations involved in training or certifying others.

What topics does ISO 9001:2015 cover?

ISO 9001 is based on the plan-do-check-act methodology and provides a **process-oriented approach** to documenting and reviewing the structure, responsibilities, and procedures required to achieve effective quality management in an organization. Specific sections of the standard contain information on topics such as:

Requirements for a quality management system, including documented information, planning and determining process interactions

Responsibilities of management

Management of resources, including human resources and an organization's work environment

Product realization, including the steps from design to delivery

Measurement, analysis, and improvement of the QMS through activities like internal audits and corrective and preventive action



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How do I get started with ISO 9001:2015?

Organizations and individuals that use ISO 9001 are encouraged to transition to the 2015 revision as soon as possible. However, the International Accreditation Forum (IAF) and the ISO Committee on Conformity Assessment (CASCO) have agreed to a three-year transition period from the publication date of ISO 9001:2015.

What are the benefits of ISO 9001?

ISO 9001 helps organizations ensure their customers consistently receive high quality products and services, which in turn brings many benefits, including satisfied customers, management, and employees.

Because ISO 9001 specifies the requirements for an effective quality management system, organizations find that using the standard helps them:

Organize a QMS

Create satisfied customers, management, and employees

Continually improve

"It has been my experience, with several companies, that the culture change associated with ISO implementation is multilayered. The first and most obvious benefit is quality awareness," ASQ senior member Bud Salsbury writes on [ASQ's Ask the Experts blog](#). "This quality awareness does not fade away easily. Even those who offer strong resistance to change learn to respect and very much appreciate all the practical value in a good quality management system."

ISO 9001 also provides financial benefits, such as cost savings.

In Nevada, the Clark County School District used ISO 9001 to save \$174 million over 10 years in actual expenditures and cost avoidance. More than 3,000 employees were trained to the standard, enabling three critical components of the system's success: training, communication and respect, and efficiency.

Read other ISO 9001 case studies to see the performance benefits of using the standard.





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Achieving ISO 9001 certification

ISO 9001 is the only standard in the ISO 9000 series to which organizations can certify. Achieving certification means that an organization has demonstrated the following:

- Follows the guidelines of the ISO 9001 standard
- Fulfills its own requirements
- Meets customer requirements and statutory and regulatory requirements
- Maintains documentation

Certification to the ISO 9001 standard can enhance an organization's credibility by showing customers that its products and services meet expectations. In some instances or in some industries, certification is required or legally mandated.

The certification process includes implementing the requirements of ISO 9001:2015 and then completing a successful registrar's audit confirming the organization meets those requirements.

As Bill Aston explains in an Expert Answers column for ASQ's *QP* magazine, organizations should consider the following as they begin preparing for an ISO 9001 quality management system certification:

- Registrar's costs for ISO 9001 registration, surveillance and recertification audits
- Current level of conformance with ISO 9001 requirements
- Amount of resources that the company will dedicate to this project for development and implementation
- Amount of support that will be required from a consultant and the associated costs



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Acknowledgements

Inovaria

Inova-Ria - Companies Association for an Innovation Network, is a non-profit organization in Aveiro, Portugal, that aims to create and strengthen an Information & Communication Technologies and Electronics Cluster.

Inova-Ria is crucial to the innovation ecosystem formed by companies, universities and research and development institutions in those technologies and currently plays an active role promoting and building collaborative efforts.

This association has been recognized as the Portugal's Center Region entity that connects a valuable set of intensive technology companies, start-ups, small and medium enterprises and also some large companies. This diversity has a high potential for creativity and enterprise competitiveness, mostly because through this "Innovation Network" it's possible to build up collaborative strategies that add more value to businesses. The younger companies have been assuming a leading role as changing forces through the creation of novel products, services and innovative business models, thereby contributing to our rejuvenation.





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Strongstep

Strongstep is a company specialized in software engineering that contributes to the improvement of software quality in the world.

Our action is based on pragmatic principles of efficiency and excellence, supported by an experienced team, by the use of best practices and with established partnerships with worldwide reference institutions.

We help organizations in the improvement of their software development processes through the implementation of practices that address people, processes and tools, taking a pragmatic and results-oriented approach.

We want to induce a change in your organization. This will represent a step with a strong, sustainable and innovative focus – a strong step!

FEUP

FEUP's Mission

The Faculty of Engineering of the University of Porto undertakes activities in the realms of education, research, and innovation at international level. Accordingly, the results of these activities lead to the creation and transmission of knowledge, training of competent and ethical professionals, and future leaders in the area of engineering and similar areas, and also the promotion of wellbeing of our global society.