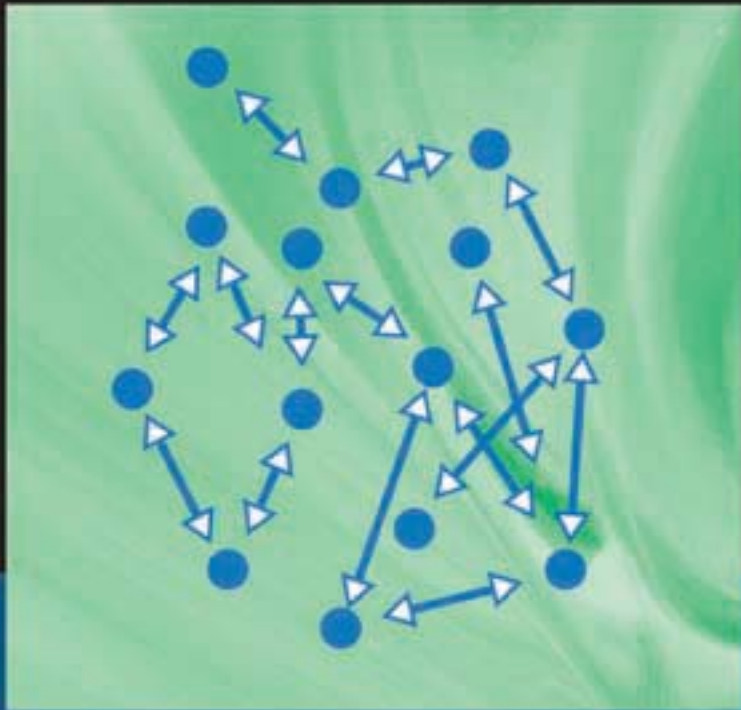# Implementing leading standards for IT management

A guide to understanding and selecting standards

Getronics

IMPLEMENTING LEADING STANDARDS

FOR IT MANAGEMENT

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Foreword

In a world in which people and organizations have to communicate in constantly changing settings standards play a big role. By standards we mean established, described, and widely accepted agreements that make communication between systems – people process and technology – possible and predictable.

Getronics has a long history in using and developing IT standards. In 1990 we introduced ITIL into the Dutch market. Subsequently we have helped redevelop ITIL and at the same time expanded the best practices with the development of ASL and BiSL. We have demonstrated our thought leadership and practical knowledge in all areas of IT management and always shared this knowledge with others. In our view a common language to communicate at different levels seems a prerequisite of the network society.

In "Implementing leading standards for IT management" we give our view on standardization in IT. We explain why standards are so important today and in which way standards come about en how they are accepted. The book describes why we adopt and use standards.

With this publication we do not pretend to give an overview of all standards available. On the contrary, it is the selection of standards we have made that makes this book useful. We think these standards are dominant, inescapable or promising.

The cooperation of people, processes and technology play an important role in the provision of good information services. Standards play a vital role in communication at all levels between the components of information services. With this book we want to help organizations making the right choices.

Alexander van der Hooft
Senior Director Division Infrastructure Professional Services & Consulting,
The Netherlands

Contents

1 Introduction

1.1 INTRODUCTION

In information and communication technology the demand for standards is increasing rapidly. Information is more and more important in our daily activities as we exchange information any where, any time. The more information we exchange, the greater the need to do so in a standardized manner. This need to communicate is caused by developments in society as well as in technology. The main developments in society are:

- development of a network society: people and organizations exchanging information are in constantly alternating contact with one another;
- growing globalization: we are dealing with worldwide markets and worldwide competition;
- economic developments inspired by globalization: businesses must reflect on their core competencies.

The main possibilities in the field of technology are:

- the growing band width for data traffic enlarges the possibilities for information exchange;
- the reduction in the costs of communication, data storage and processing leads to information being exchanged in greater quantities;
- the success of the Internet and its common use: anyone with a computer and an Internet connection can create an application that can be used by anyone, anywhere at any time.

The influence these developments have on the use of information systems is enormous and the consequences for IT organizations are huge. Information systems are interlinked in our society and function well thanks to the clever choice and use of standards.

1.2 OBJECTIVE OF THE BOOK

This book can help organizations in making "smart decisions" about standards and it describes a selection of them in detail. This selection is arbitrary but is based on standards that are currently widely accepted and new quality standards that fill a certain gap. This selection covers all relevant domains within IT and the organization of IT.

Chapter 1: **Introduction**

Chapter 2: Standards, why?

- A changing society
- Technological developments
- Changes in organizations

→ Consequences for the information provision

Chapter 3: Standards, what types?

- Characterization
- Classification
- For what?

Chapter 4: Which standard and when?

- Situations
- Organization related
- Technology related

Chapter 5: Dealing with standards

- Introduction
- The business case
- Accepting standards
- Imposing vs adopting

Figure 1 Structure of this book

1.3 STRUCTURE OF THIS BOOK

The book is divided into six chapters.

Following this introduction, the second chapter describes the context of standards and deals with:

- changes in society and the need to exchange more and more information;
- changes in technology enabling more and more communication;
- the changing role of IT in organizations due to the increased value of IT for organizations;

- the consequences of all these changes for IT and the need for standards.

The third chapter deals with the types of standards and concentrates on:
- what are standards, what characteristics do standards have, what are the distinctions between various standards and the management of standards;
- a classification for standards;
- subjects and approaches for standards.

Chapter 4 offers guidance in choosing the right standard. Basically, standards can be categorized as:
- standards for the IT organization;
- standards for IT technology.

Chapter 5 explains how to apply standards, by discussing:
- the choices available;
- the right moment to introduce a standard;
- the business case for a standard;
- applying standards in the correct environment.

Chapter 6 is a reference with a short description of 21 important standards.

1.4 DEFINITIONS

In this book, we shall consistently refer to the subject with the term "standard". This is in order to improve legibility and prevent discussions and linguistic confusion. By referring to something in this book as a standard, we do not mean that it already has the status of a standard, even though this is difficult to establish objectively. We refer to something as a standard if it pretends to offer a standardized approach for a certain domain. The term "standard" is therefore not intended as a value judgment, but as a general term. This includes all initiatives for describing and distributing libraries, best practices, models and frameworks with the objective of establishing a standard.

1.5 WHO BENEFITS FROM THIS BOOK?

Choosing a standard cannot be a solitary decision. Business unit managers and general managers will have to agree together with IT managers and IT specialists as to where and when specific standards are used. This book is designed for professionals involved in selecting and implementing Information Technology standards in their organizations.

EFQM	European Foundation for Quality Management
Six Sigma	Methodology for eliminating "defects" in manufacturing
Malcolm Baldrige	National Institute of Standards Quality Award
CobiT	Control Objectives for Information and Related Technology
ITIL	Information Technology Infrastructure Library
ASL	Application Services Library
BiSL	Business Information Services Library
ISO/IEC 20000	The ISO standard based on BS15000
CMMI	Capability Maturity Model Integration
ISO 17799	Code for Information Security
MOF	Microsoft Operations Framework
ISPL	Information Services Procurement Library
PRINCE2	Projects in Controlled Environments
IPMA/ICB	International Project Management Association
PMBoK	Project Management Body of Knowledge
MSP	Managing Succesful Programmes
XML	Extended Markup Language
J2EE	Java 2 Enterprise Edition
.NET	Microsoft Webservices Technology
UML	Unified Modelling Language
MDA	Model Driven Architecture

Figure 2 The standards discussed in chapter 6 of this book

2 Standards: why?

2.1 A CHANGING SOCIETY

Past decades have been characterized by major changes in society and the economy. We shall take a closer look at a few of these changes to see their influence on the necessity to choose and use standards. We can establish that:

- society is undergoing ever faster changes;
- a network society is being created;
- globalization is advancing;
- new legislation and regulations are being made;
- information is more valuable in society today.

2.1.1 Society is changing fast

Within a few decades the digital revolution has provided us with a virtual world alongside our actual world. The speed in which we must adapt to changes around us is faster than ever. If organizations and businesses do not change fast enough they will be defeated, thus creating room for new adapting organizations. Citizens also need to constantly adapt to the speed of changes around them.

2.1.2 The development of a network society

We see a network society emerge. In this society organizations continuously cooperate with different and new partners. Some organizations even depend on the networks in which they participate. The players in a network each have their own interest and responsibility and are no longer hierarchically related to one another. In a network, one can participate or not and so one sticks to the rules accepted by the group.

If an organization cannot dominate the network, the only possibility to excel is to focus on core competencies and constant reconsiderate one's own added value in the network. Organizations will be replaced if they fail to do so. The development towards the network society is not new, but what makes it so different is the speed with which one must be able to adapt, the scale in which changes take place and the fact that this takes place throughout the entire world. Exchanging information is becoming complex since networks involve a lot of partners and it means that effective communication depends on more than just two players.
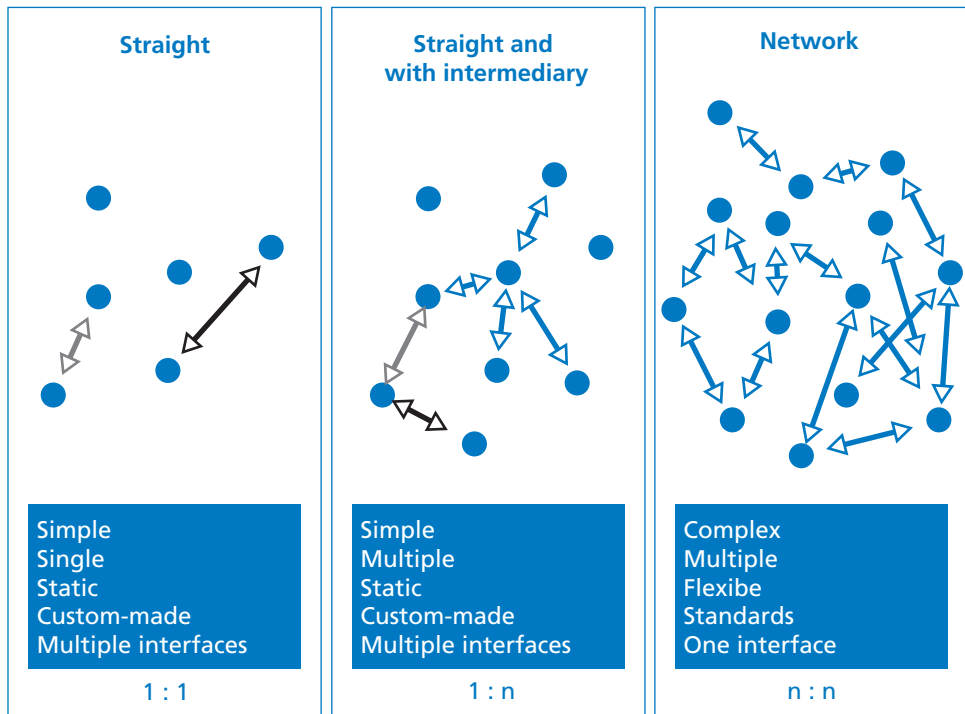
Figure 3 Contacts in a network

The way in which organizations communicate is based on the choices of all involved. If only two players are involved they can develop or choose their own means of communication. If more players are involved one of them can function as an intermediary. An intermediary function is only useful in a relatively static network and satisfies situations where the cooperation proceeds over a longer period between the same players, see figure 3. The network society is characterized by flexibility of the chains. This flexibility is only achievable thanks to a standardized approach for mutual data exchange. In such a network the standard takes over the role of the intermediate.

2.1.3 Globalization

By using electronic commerce and participating in networks, organizations increase their chances for success but also face growing competition. New, fast-growing economies in Asia and Latin America are entering our markets. The European Union is being expanded with enthusiastic new members that are willing to do everything to be successful on this new market. Trade agreements not only create new possibilities but also block the current ones. Historical stability on a regional and a global scale no longer offers anything to hold on to. A key to success for an organization on this world stage is having the correct information on time.

2.1.4 Legislation and regulations

International cooperation or international presence for organizations implies that their information flows must take into account international legislation and international standards. For example, the rules in international accounting are laid down in the International Financial Reporting Standards (IFRS). Directors of international concerns represented on the American stock market must adhere to the Sarbanes-Oxley Act (SOX). China considers adopting international accounting rules since their business is spreading more and more outside their own borders.

Alongside this, shareholders want transparency and insight into the ins and outs of the organizations of which they are co-owners. Each action must be traceable. Corporate governance has almost become a matter of public interest. The consequences for IT are apparent. Controls, reports and overviews must be based on the same open standards.

2.1.5 Information society

In our information-based society organizations need information faster and in more locations at the same time in order to offer sufficient added value. According to Carlota Perez[1], information is changing gradually from a production resource into a capital asset. Information provision has increased enormously both in importance and in complexity. The interest in information provision is great and by no means the domain of IT departments alone. There is a demand for manageability and predictability. Standards help provide this.

2.2 TECHNOLOGICAL DEVELOPMENTS

It is difficult to envisage developments in society as being separate from developments in technology. We see a few important trends in this area:
- growth in available band width for communication;
- growth in possibilities for data storage;
- unimpeded use and possibilities for micro technology.

2.2.1 Growth of band width

Broadband is now widely available on many locations at the rate of at least 10 MB per second – a few years ago this was just 128 KB per second. World-wide fiber optic networks and wireless networks have been installed for digital applications. Information systems have to be increasingly capable of exchanging data. Separate application domains such as telephony and information technology tend to converge on a large scale. Choosing the correct standard in this fast changing world is very difficult but imperative.

2.2.2 Growth of data storage

Compression techniques and miniaturization enable the storage of greater quantities of data at the same cost. Alongside the physical world, a strongly growing digital world is

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1   Technological Revolutions and Financial Capital, Business Economics 2003

emerging in the form of documents and multimedia files. This digital world must be well protected against unauthorized and improper use.

2.2.3 Micro technology
Moore's law still applies: computer chips continue to grow in capacity but not in size. Miniaturization and cost reduction of computer chips and associated technologies continue unabated. Data is produced in almost all conceivable places in the world: from the engine management in your car to the sensors on the measuring stations at the polar caps. Standards are required in order to be able to move and interpret all this data.

The result of these technological developments is that the information flows will grow fast as well as the information systems that control them. The need to standardize and make agreements to keep organizations and technology efficient and effective will grow accordingly.

2.3 CHANGES IN ORGANIZATIONS
Changes in society and the technological developments stimulate organizations to adapt continually. We observe that:
- organizations change in distinguishable phases;
- the role of IT adopts with each phase;
- organizations operate more and more within chains and networks;
- the importance of IT in our society increases.

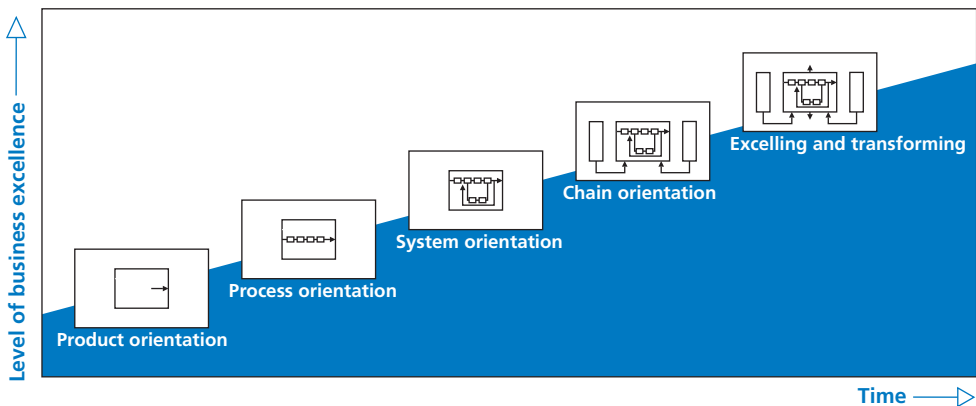We will deal with these aspects a little further below.

Figure 4 INK model for organizational development

2.3.1 Organizational development in phases

The Dutch Quality Institute (INK) has adapted the EFQM model of the European Foundation for Quality Management by adding phases for organizational development. This model, see figure 4, depicts the development of organizations from product orientation, via process, system and chain orientation to focus on total quality. In the phase Excelling & transforming, organizations are in a position to adapt quickly and adequately to the constantly changing environment.

2.3.2 IT development in phases

IT systems are undergoing a similar development. They had to adapt to the developments and changes that organizations went through. IT systems' original function was to register data. The next step was linking this data with the help of systems for exchanging and validating data (information brokers). Now various departments could work on the same processes and share the same data. At the same time came the Internet and the need for improved service to clients. This led in many organizations to websites that often operated seperately from existing information systems. It was not the IT department but the communication department that managed these electronic front offices that were modeled in the same way as paper-based communication. The possibilities of websites were initially limited to one-way communication towards clients and they functioned as a new medium for information provision.
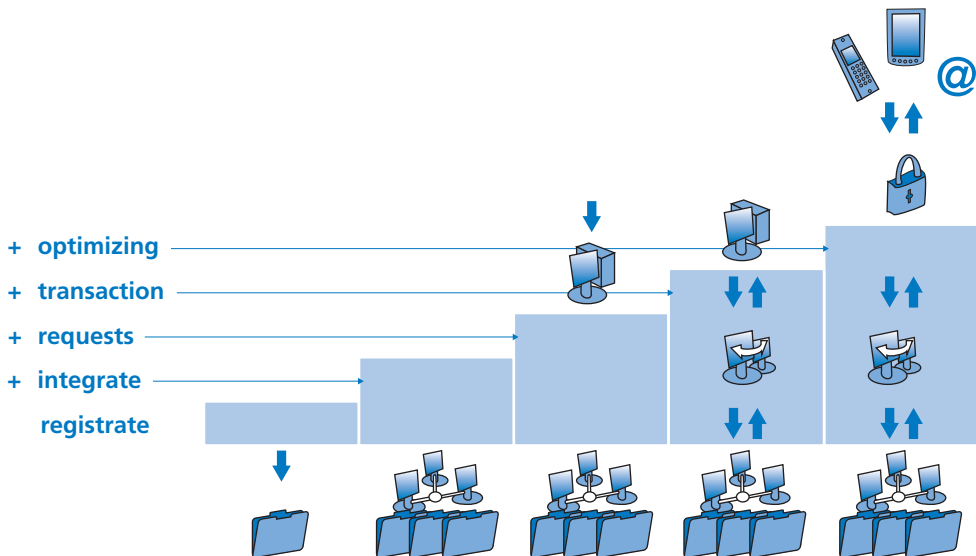

Figure 5 Development in IT

Currently, the front office is used more and more as an electronic counter for services that are processed electronically. The need to exchange information from clients to departments and back requires good communication between the departments involved. The website has become the shipping department for products as well as a central service point. This is how the role of the front office shifts from a supporting to a crucial element in this customer oriented process.

The development phases of IT correspond with the development phases of organizations (or departments). The IT systems in use fit the current organizational phase. In other words if organizations use their information systems only to register data they are not likely to have websites with interactive services.

2.3.3 Supply chain integration

New front office technology enables not only the clients but also suppliers and partners to be loosely coupled in the production process of an organization. Consequently responsibility for the IT solutions is no longer the exclusive domain of IT departments but extends towards the management of the production processes. The success of the IT solutions depends to a large extent on the alignment with the business they support. IT solutions need to be adaptable in order to support fast changing business processes. Back office applications will therefore be constructed with reusable components based on architectures, using standards for exchanging information.

2.3.4 Information society

In our society we see a similar development in phases, getting closer to the information society step by step. Figure 6 shows how governments in general progress to inter-sectoral networks. In this representation of the future, information represents an important production means. Without standardization it will not be able to meet the demands: minimize costs and availability anywhere, anytime.

2.4 INFORMATION PROVISION

The need for information in our society seems never-ending. We are sharing more information faster, both within and between organizations. This has consequences for the information provision:

- IT in organizational networks cannot be isolated;
- a new generation of organizations, the Real-time Enterprise, continually adapts its information provision to the environment;
- the management of information provision gets more and more fragmented: both within as outside organizations (outsourcing);
- the control over information flows and data is getting more and more complex;
- privacy and security are playing a growing role. Society demands an open and transparent approach to available information but on the other hand wants it to be more and more secure.

These consequences show the paradox of standardization: freedom by restriction. It will be difficult to cope with these developments without standards and agreements.
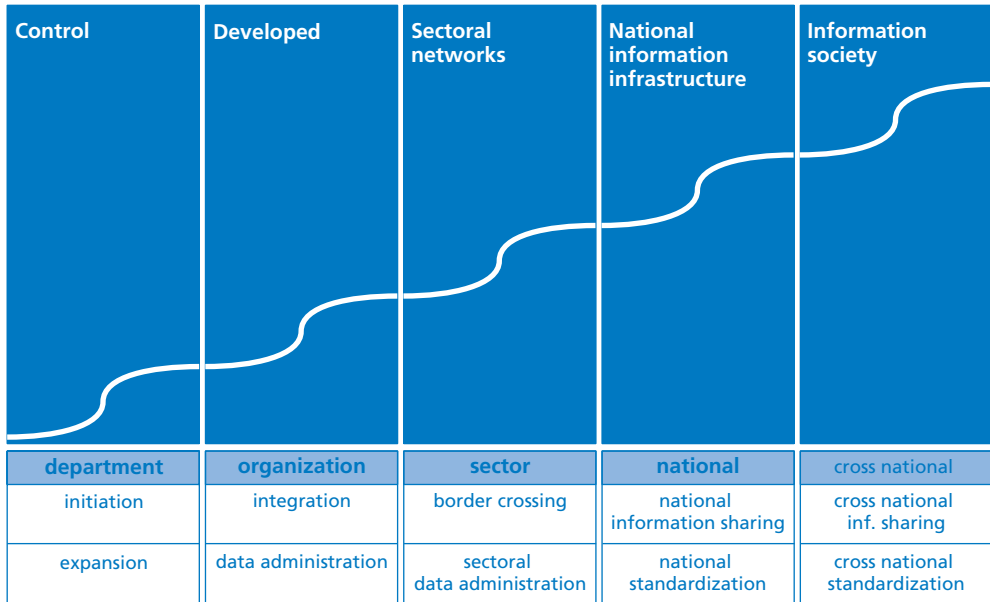
Control	Developed	Sectoral networks	National information infrastructure	Information society
department	**organization**	**sector**	**national**	cross national
initiation	integration	border crossing	national information sharing	cross national inf. sharing
expansion	data administration	sectoral data administration	national standardization	cross national standardization

Figure 6 The route to the information society[2]

2.4.1 IT in networks

The information provision in an organization is part of a larger context. Decisions can no longer be based on internal arguments alone. Organizations that decide to make their content available to others via the Internet can not always force their own systems on to other organizations.

Only when the cooperating organizations manage their content using the same conventions (common standard) will they be able to actually share information. In such situations, the independent structures that controlled the original systems have been exchanged for a network of users who have become independent from one another by restricting themselves to a common standard. In order to participate in this type of network, a clear vision of the future and an acceptable plan of how to get there is essential. Therefore the focus on information architectures has intensified over the past few years.

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2   Prof. Zuurmond, The Nolan Plus Model, Journal of Public Policy, Vol. 25 No. 1, 2005

2.4.2 Real-time enterprise

Organizations are technically ready for "real-time functioning" if the applications they use can automatically react to changes in two or more other applications. The standards and techniques supporting this concept are currently gaining in popularity. The business processes and the supporting information provision will gradually merge together.

According to Gartner, the IT function is changing from a purely technological component to one that is more and more geared to the organization. It boils down to technology becoming not much more than a commodity. This can only happen with the intensive use of standards and smart adoptable infrastructures.
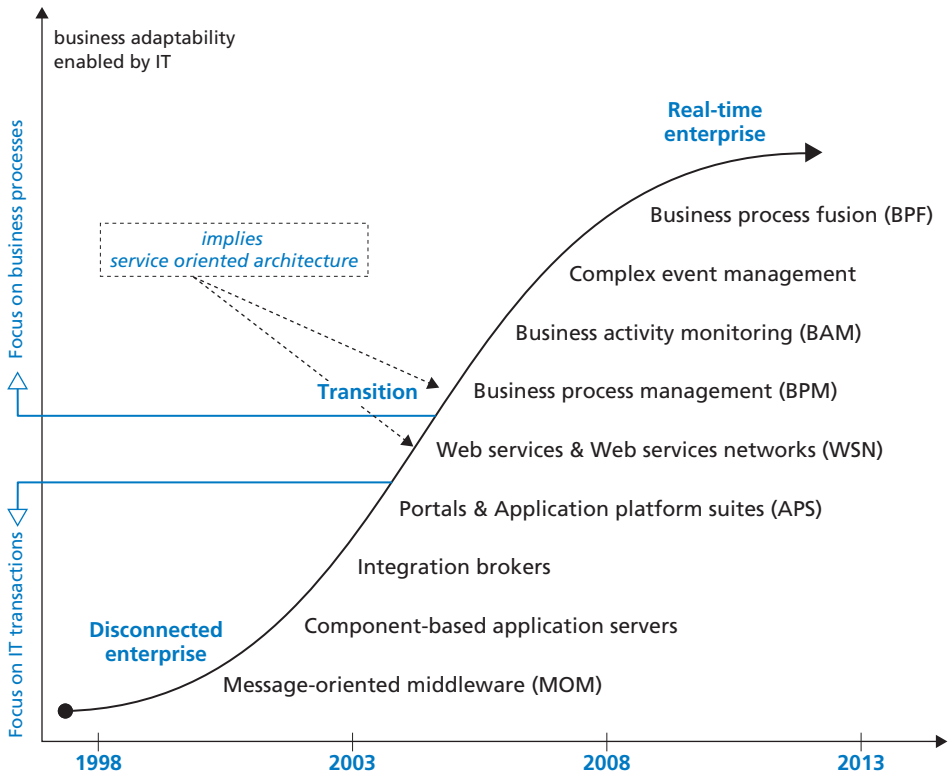
Figure 7 The Real-time Enterprise according to the Gartner Group

The real challenge for IT exists in the complex question as to how IT resources can keep pace with the ever-changing business demands. In fact, the ancient and rigid *supply chains* in which it was very difficult to link large and autonomous applications to one another are evolving into new flexible *demand chains*.

2.4.3 Fragmentation of the IT function

The IT function has become more and more fragmented from a central department into a network of coordinated units following central guidelines or standards. The supply chain in which IT services are being produced transcends departmental boundaries and demands continually improved coordination between all parties concerned. Focusing on the core competencies of organizations also leads to departments being out tasked or outsourced. Specialized suppliers often provide higher quality for lower costs, provided that good agreements are made. The need for a standardized language for establishing agreements on the information provision has developed over the years.

In the time that organizations managed large IT departments, the focus was on infrastructure management. Later, in the case of various departments using centralized applications, there came an increasing focus on application management. Now that the information provision encompasses various organizations or is even done entirely by other organizations all attention goes to business information (systems) management. The more the services proceed in a standardized manner, the better the various departments can communicate with one another.

2.4.4 Control and management

Control and management of who does what and how this is recorded is the object of workflow management. Workflow management systems were originally designed to support information flows within organizations but are no longer limited to this domain and concentrate on the entire chain. The control of the information flows becomes more complex as more and alternating players appear in a chain. The Workflow Management Coalition is one of the working groups that try to create answers to this problem. This resulted for example in the XPDL format, the XML standard for processes of the Workflow Management Coalition.

In order to keep track of a document over time, it is important to keep record of modifications to the document. It is insufficient to determine in standards how documents should be stored. Standards on handling documents until ten years from now need to be agreed upon, as there are many legal provisions stating that digital archives must be as durable as old style paper archives. The storage method must be as independent as possible from the current available technology. There is not much data we stored ten years ago that we can retrieve and read with the technology or software available today.

2.4.5 Privacy and security

As well as all agreements needed to create the digital world, more agreements are needed to keep this new world safe and reliable. There must be agreements as to how someone's identity can be established, checked and validated. The Government often wishes to control and register what people and organizations are doing. We must be able to trust digital archives. It is clear that the Government plays a major role regarding standards, because it is the representative of the largest interest group of users of all these standards.

2.4.6 The paradox of standards

We have determined the relationship between changes in our society and the role of standards in dealing with these changes. Standards however are not just cooperative and willing. The stakes are often high when a standard is promoted and distributed. Here lies a paradox; the choice to work with standards is one of freedom by restriction. Freedom because standards give us the possibility of taking a step forward and restriction because each standard forces us to either remain within certain common parameters or be isolated. Standards are necessary for creating flexibility in order to be able to operate quickly with other organizations in a chain. But when a standard is accepted by a lot of parties, it becomes very difficult to change it or get everyone to accept a changed standard. Each standard is actually a compromise of collective and individual interests. Each organization will want to use and adapt standards according to its own strategy and own needs. Opposite to this selfish force is the rational force of not compromising the standard in the general interest.

2.4.7 The necessity for standards

Considering all of the above, are standards really that important? Information has become part of our daily lives, more than we ever thought possible. It has become a means to creating added value. Our information society can only exist by making agreements on data exchange. The more complex the information flows, the more standards are needed. The objectives of these standards are:

- making data exchange possible and predictable thus increasing effectiveness and creating added value;
- reducing the costs of information thus increasing efficiency.

We encounter this standardization on various abstraction levels, relating to technology, people and processes. Standards are only standards if they are public domain and freely available. Standards ensure that predictions can be made as to how systems will perform.

In the following chapters, we examine more aspects of standards and we look at the consequences of adapting them.