



IT management in European banking groups

2011 survey

Rif. QUEINT-EN-2011-68

CIPA, 2012

Address

Banca d'Italia Servizio Innovazione e Sviluppo Informatico Divisione Sviluppo Automazione Interbancaria Centro Donato Menichella Largo Guido Carli, 1 – 00044 – Frascati (RM)

Tel. +39 06 4792 6803

Fax +39 06 4792 6801

Website

<u>www.cipa.it</u>

The use of this questionnaire, or any part thereof, for purposes outside the scope of the present survey is subject to the prior consent of CIPA and ABI.

The electronic version can be downloaded from the following section of the CIPA website: Documenti ⇒ Rilevazione dello stato dell'automazione del sistema creditizio

Coordinators of the interbank group	Banca d'Italia – CIPA ABI	Isabella Vicari Romano Stasi	06 • 4792 6803 06 • 6767 270
	<i></i> е. е		
<i>Help in completing the questionnaire can be obtained from</i>	Banca d'Italia – CIPA ABI Lab ళా • అ	Paola Mostacci Pier Luigi Polentini Alessandro Pasciuto Andrea Gentili Ernesto Ferrari Daniela D'Amicis Francesco Cavallo Silvia Attanasio	06 • 4792 7682 06 • 4792 6449 06 • 4792 6660 06 • 4792 6517 06 • 4792 6469 06 • 4792 6943 06 • 4792 6101 06 • 6767 793

Contents

Introduction	.5
Data on the compiler and the unit	.6
Questionnaire	.7

Introduction

The survey is aimed at the main European banking groups with operations in Italy and the leading internationally active Italian banking groups.

The information, provided on a voluntary basis and collected by CIPA and ABI, is used exclusively for the purposes of the survey and is released only in aggregate form. The data are processed, without the intervention of third parties, using procedures that ensure their security and confidentiality.

Objectives

The questionnaire is reserved to internationally active Italian banking groups and the main European banking groups with operations in Italy via branches or a subsidiary. The objectives of the survey are to obtain information on:

- groups' IT structures, their location and the predominant organizational model;
- the amount and breakdown of groups' IT costs;
- the tendency towards the integration of IT services and data centres;
- the main trends of technological innovation.

The survey and feedback

As part of a working group, CIPA prepares the questionnaire and distributes it to a sample of European banking groups. The participants in the survey compile the questionnaire and send it to CIPA, which checks the results in close collaboration with the compilers to ensure the homogeneousness and correctness of the data provided. The data acquired in this way are then processed to produce the statistics on the phenomena covered by the survey.

At the end of the processing CIPA makes the statistics and aggregate data available to:

- the public, with the survey report;
- the participant groups, with the "individual feedback".

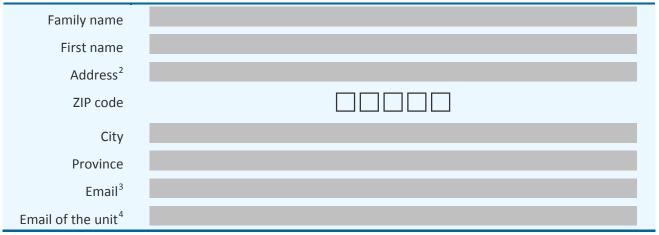
Data on the compiler and the unit

Identity of the bank ABI code¹ Company name

Identity of the international group the bank belongs to

Name

Identity of the compiler of the questionnaire



¹ In the case of an Italian banking group, enter the ABI code (five digits excluding the CIN) of the parent bank; in the case of a foreign banking group, enter the ABI code assigned to the foreign bank branch/subsidiary operating in Italy.

² Enter the company address with all the information requested, so as to permit the delivery of letters and parcels.

³ E-mail address of a referral to request information and clarifications or to draw attention to compilation errors.

⁴ E-mail address of the unit involved in the survey (not linked to a natural person). If not available, please specify an e-mail address different from the one above, to be used as a backup.

Questionnaire

1 Indicate the main activities of the group as a percentage of its total business, based on the gross income.

Activities	%
Retail banking	$\Box\Box\Box$. $\Box\%$
Corporate and investment banking	$\Box\Box\Box$. $\Box\%$
Private banking	$\Box\Box\Box$. $\Box\%$
Other, specify:	$\Box\Box\Box$. $\Box\%$
Total	100%

2 Indicate the number and geographical distribution of the banks belonging to the group at December 31st 2011⁵.

Geographical Area ⁶	Number
Mediterranean Europe Andorra, Cyprus, Greece, Italy, Malta, Portugal, San Marino, Spain, Turkey	
United Kingdom	
Central Western Europe Austria, Belgium, France, Germany, Republic of Ireland, Liechtenstein, Luxembourg,	
Monaco, Netherlands, Switzerland	
Northern Europe Denmark, Finland, Iceland, Norway, Sweden	
Eastern Europe Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Moldova, Montenegro, Poland, Romania,Republic of Macedonia, Russian Federation, Serbia, Slovakia, Slovenia, Ukraine	
North America Canada and United States of America	
Central and South America	

⁵ Indicate the number of group banks present in each of the areas specified; the total number of group banks is calculated automatically. In this questionnaire, a bank is an operating structure in which banking activities are performed.

⁶ Only the key states for each Geographical Area are reported; the list is not exhaustive.

Middle East Bahrain, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Palestinian Territories, Qatar, Saudi Arabia, Syria, United Arab Emirates, Yemen	
Asia	
Africa	
Australia	
Other, specify:	
Total	

3 Indicate the number and geographical distribution of the IT units used by the group (at both banks and instrumental companies).

Geographical Area	Number
Mediterranean Europe Andorra, Cyprus, Greece, Italy, Malta, Portugal, San Marino, Spain, Turkey	
United Kingdom	
Central Western Europe Austria, Belgium, France, Germany, Republic of Ireland, Liechtenstein, Luxembourg, Monaco, Netherlands, Switzerland	
Northern Europe Denmark, Finland, Iceland, Norway, Sweden	
Eastern Europe Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Moldova, Montenegro, Poland, Romania,Republic of Macedonia, Russian Federation, Serbia, Slovakia, Slovenia, Ukraine	
North America Canada and United States of America	
Central and South America	
Middle East Bahrain, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Palestinian Territories, Qatar, Saudi Arabia, Syria, United Arab Emirates, Yemen	
Asia	
Africa	
Australia	
Other, specify:	
Total	

4 Indicate the location of the group's IT activities.

- 1. Yes
- 2. No

	Inse	ourcing	Outsourcing	
	Banking component	Non-banking component ⁷	EU	Non-EU
Central systems ⁸ Mainframes and server farms				
Transmission systems ⁹ Data networks, fixed and mobile telephony				
Peripheral systems ¹⁰ Distributed systems, ATMs, POS				
Applications ¹¹ Software development and maintenance				

5 Which organizational model is primarily used for IT management at group level?

- 1. Centralized¹²
- 2. Distributed among competence centres¹³
- 3. Decentralized¹⁴
- 4. Centralized with some competence centres

⁷ E.g. Instrumental company for IT.

⁸ Central systems comprise mainframes (central computers and centralized input/output units) and server farms (batteries of centralized servers and equipment with specialized functions not typical of branches and not directly dependent on mainframes).

 ⁹ Transmission systems comprise data networks (links between the bank's head office and branches, between the central and peripheral subsystems, and with the external environment), fixed telephony (including VoIP) and mobile telephony.

¹⁰ Peripheral systems comprise distributed systems (systems at the lowest hierarchical level, e.g. personal computers, printers, money exchangers, ticket machines), ATMs (automatic counters, such as banknote dispensers and multifunction kiosks) and POS.

¹¹ The IT activity "applications" comprises the development and maintenance of application software.

¹² In the centralized organizational model, the group's components refer to a shared IT center.

¹³ In the distributed among competence centres organizational model, various IT centres with specific skills exist (e.g. competence center for the corporate customers, competence center for the mobile applications, etc.)

¹⁴ In the decentralized organizational model, the group's banks own indipendent IT centers.

6 If IT management is primarily distributed among competence centres (Answer 2 or 4 to Question 5), indicate whether they are primarily specialized by:

 \square

 \square

- 1. Business area
- 2. Technology
- 3. Customer segment
- 4. Geographical area
- 5. Other, specify:

7 Does a formalized system exist to detect the IT sector performances?

- 1. Yes
- 2. It will be adopted by 2013
- 3. No
- 8 If a formalized system exists to detect the IT performances (Answer 1 to Question 7), which of the following elements are detected? Rank the items in decreasing order of importance (1 most important) omitting those not observed and without repeating any values.

	Costs (of the process, of the services)	
	Building time	
	Quantity of products/services	
	Quality of products/services	
	Backlog for activities to be implemented	
	Resources absorbed	
	Service levels	
Other, specify:		

9 What is the amount of total assets, operating costs and gross income at group level (consolidated accounts for 2011, millions of €)¹⁵?

Operating costs	Total assets	
Gross income	Operating costs	
	Gross income	

¹⁵ Please, determine the amounts requested, referring to the corresponding balance-sheet items at December 31st 2011.

Total assets: see the consolidated balance sheet;

[•] Operating costs: see the consolidated income statement;

[•] Gross income: see the consolidated income statement.

10 Indicate the total amount of IT costs¹⁶ incurred at group level in 2011 and expected in 2012 (in millions of €).

	2011 consolidated accounts	2012 budget
тсо		
Cash-out		

11 Indicate the percentage breakdown of the total IT costs for 2011 (see Question 10, TCO, 2011 consolidated accounts) for each of the productive factors listed below:

Productive factors	% of TCO
Hardware ¹⁷	$\Box\Box\Box$. $\Box\%$
Software ¹⁸	$\Box\Box\Box$. $\Box\%$
Group personnel ¹⁹	$\Box\Box\Box$. $\Box\%$
Services received from third parties ²⁰	$\Box\Box\Box$. $\Box\%$
Other IT costs ²¹	$\Box\Box\Box$. $\Box\%$
Total	100%

- System software needed for the functioning of the apparatus at every level;
- Application software purchased from outside the group in the form of products developed on the basis of specifications identified by the supplier.
- ¹⁹ Group personnel (bank and non-bank) that performs IT functions.
- ²⁰ Services received from third parties comprise:

- Outsourcing of information systems for complete processing services provided by non-group suppliers;
- Services provided by non-group suppliers (e.g. network services, management of distributed systems, disaster recovery services, implementation of application software and/or software maintenance projects, for which payment is based on the product – turnkey projects);
- Activities performed by personnel of non-group companies, for which payment is calculated on a time and material basis;
- Professional consultancy services on IT matters.

²¹For example:

- Costs borne for buildings or parts thereof used exclusively for IT activities.
- Costs borne for auxiliary equipment, insurance cover, etc.

¹⁶ Data refer to December 31st 2011. In this questionnaire, the following definitions are used:

TCO – Total Cost of Ownership: the sum of current expenditure and depreciation for the year (including writedowns);

[•] Cash-out: the sum of current and investment expenditure for the year.

The TCO of the reference year is used to calculate most of the indices and prepare the feedback on an individual basis. The accuracy of the figure is of key importance for the subsequent processing.

¹⁷ Equipment that makes up the central systems, transmission systems and peripheral systems managed within the group by banking components or non-bank group companies.

¹⁸ Software comprises:

[•] Facility management for processing services carried out by and on the equipment of non-group suppliers but using application software owned by the group;

12 On what fronts are savings (in terms of TCO) mainly being sought? Rank the items in decreasing order of importance (1 – most important, 8 – least important) omitting those not observed and without repeating any values.

Renegotiating contracts with the same supplier	
Replacing a supplier with another	
Rationalizing the use of products/services	
Rationalizing consumption	
System/application consolidation	
Process revisions, internal reorganizations	
Outsourcing initiatives	
Insourcing initiatives	

13 Are there any projects – already completed, under way or planned – for the crossborder²² integration of the information system?

- 1. Yes, they have been completed
- 2. Yes, they are under way or planned by 2013
- 3. No
- 14 If the answer to Question 13 is 1 or 2, indicate which of the following components have been subjected to the cross-border integration, specifying for which levels and criteria.

 \square

- 1. Yes, entirely
- 2. Yes, limited to some systems or applications
- 3. No

	Elaboration Infrastructures	Transmissive Infrastructures	Application Software
Interoperability of existing systems			
Adoption of standard solutions on existing systems ²³			
Concentration on a single platform			

²² Indicate whether activities aimed at unifying the information systems of group's banks located in different countries have already been completed or are under way or planned.

²³ Here "standard solutions" means "group's standard solutions" and not necessarily "market standard solutions".

15 Indicate the percentage breakdown of total cash-out (as given in Question 10, cash-out, consolidated accounts for 2011) for each of the following functional areas²⁴.

Functional areas		% of cash-out	
	Management/auditing internal auditing, anti-money-laundering activities, management reporting and		
А	operations control. Compliance		
Management	Compliance management systems.		
	Risk management ALM applications, verification of compliance with capital ratios and other prudential supervision quantitative rules, risk control (credit, market and operational risks).		
	Administration and accounting Procurement and supply office, general accounting, shareholder register, real estate management applications, budget.		
	Help desk Internal help desk, trouble ticketing.		
В	Reports Reports to the supervisory authorities, judicial enquiries.		
Support services	Human resources Personnel management, management of presences/absences, transfers, reimbursements.	$\Box\Box\Box$. $\Box\%$	
	Internal organization		
	Mapping of processes, internal rules and regulations.		
	IT management and processes		
	Project management, demand management, etc. Other services		
	Intranet, email, foreign branches.		
	Credit		
	Overdrafts and guarantees, bad debts and impaired loans, risk reports, leasing, factoring, mortgage, loans.		
	Foreign sector Foreign exchange, international payments, foreign loans.		
С	Finance and treasury Securities (own securities, third-party securities, bond issues, derivatives, repos), funds (investment and pension funds, depository/placement bank), performance of tax requirements for securities, portfolio management, treasury services		
Operations	Payments	$\Box \Box \Box \Box . \Box \%$	
Operations	Cheques, credit transfers, taxes and sundry services, direct debit and paper order forms (Ri.Ba, RID, MAV), treasury services for public bodies, utility bills, payment of pensions, payment of taxes, correspondent banking.		
	Plastic money		
	POS, payment cards.		
	Other applications		
	ID records, cash management application, current accounts, deposits, information provided to customers, conditions.		
D	Direct customer channels		
Marketing, sales	ATM, phone banking, call centres, internet banking/trading on line, corporate banking, mobile banking.		
and customer	Support for sales		
service	Marketing information, CRM applications, business intelligence.		
	Total	100%	

²⁴ To facilitate compilation of the questionnaire and make the observations adequately homogeneous, four functional areas have been identified (A, B, C and D). The classification shown in the table is indicative and does not include all the possible components of each area.

16 Indicate the percentage of total cash-out (as given in Question 10, cash-out, consolidated accounts for 2011) incurred for Run the business (RTB) and Change the business (CTB) for each of the two macro functional areas shown below²⁵.

	% of cash-out		Run the business ²⁶		Change the business ²⁷
Functions area (A Management + B Support services)	nnn,n%	=		+	
Business area (C Operations + D Marketing, sales and customer service)	nnn,n%	=	$\Box\Box\Box$. $\Box\%$	+	
Total	100%	=	nnn,n%	+	nnn,n%

17 What is the percentage ratio of expenditure on compliance to total cash out (as given in Question 10, cash-out, consolidated accounts for 2011)?

% of cash-out	$\Box\Box\Box$. $\Box\%$

18 Divide the percentage ratio of expenditure on compliance to total cash out (Question 17) among the following categories of compliance intervention²⁸.

n % of <i>cash-out</i>	Categories of compliance intervention
	SEPA / PSD Adaption interventions related to the SEPA and to the Payment Services Directive.
$\square\square\square.\square\%$	MiFID Interventions aimed at verifying the respect of the rules of the Investment Service Directive ²⁹ .
	Anti-money-laundering/Loan shark/Counterfeit Interventions related to the contrast of lawlessness: money laundering, terrorist financing, financing of programs for the proliferation of weapons of mass destruction, loan sharking interest rates, falsification, etc.
f 🗌 🗌 🗌 🗌 🧐 🖌	Accounting/tax legislation Implementation of international IAS / IFRS principles, VAT rules, patterns and rules of compilation ³⁰ and opposition to national and international tax fraud.
	Privacy Interventions to ensure the compliance with the principles regarding the protection of personal data of customers or employees (eg, "Guidelines on the processing of personal data of customers in the banking sector", " the protection code of personal data ".

²⁵ The percentages of the first column are derived automatically from the responses to the previous question. The percentages of the last row are derived automatically as the sum of the column.

²⁶ Run the business (RTB) is the percentage of cash-out used to keep the current operations running.

²⁷ Change the business (CTB) is the percentage of cash-out used in improving and innovating IT systems to support banking operations, including evolutionary maintenance.

²⁸ Each category includes all the mandatory interventions for the group. Interventions arising from regulations or policies within the group must be excluded.

²⁹ 2004/39/CE and subsequent amendments and regulations.

³⁰ Typically budget, notes and management report.

	Supervisory legislation	$\Box\Box\Box$. $\Box\%$
	Interbank legislation	$\Box\Box\Box$. $\Box\%$
Other, specify:		$\Box\Box\Box$. $\Box\%$
	Total	100%

19 What is the percentage spent of total cash-out (Question 10, cash-out, 2011 consolidated accounts) on technological innovation³¹?

9	6 of cash-out	

 \square

- 20 What is the trend expected for spending on technological innovation (in terms of cashout)?
 - 1. Rising
 - 2. Stable
 - 3. Falling

21 Are there any projects – already completed or planned – for investment in one or more of the technological environments listed below³²?

- 1. Yes, completed in or planned by 2012
- 2. Yes, planned by 2013 2014
- 3. No

Technological environment	For internal functions	For customer services
Contactless		
Biometric recognition systems		
Mobile applications (smartphone, tablets,)		
Social networking		
Business intelligence		
Big data		
Cloud computing		
VoIP		
Web conferencing		
Service-oriented architecture (SOA)		
Green IT		

³¹ The technological innovation referred to here does not concern the renewal of existing procedures or equipment but efforts to change the group companies and their functions (cutting edge innovation).

³² For a description of the technological environments, see the table "Technological environments" at the end of the questionnaire.

22 If application solutions and / or infrastructure that rely on cloud computing are in use, what is the model they refer to?

1. Yes

2. No

	Public cloud	
	Private cloud	
	Community cloud ³³	
	Hybrid cloud ³⁴	
23	Are open source solutions adopted or developed?	
1.	Yes, and code changes are shared with the community	
2.	Yes, but the solution is never modified or code changes are not shared with the community	

3. No

24 What aspects of IT security are more important in terms of expenditure (seen as TCO)? Rank the items by decreasing expenditure (1 – greatest expense) omitting those not observed and without repeating any values.

Identity Management Identity management for authentication, authorization, rights / grants / permissions system, access control by the staff to the company's information resources	
IT Risk management IT Risk Management; Security Assessment; Penetration Test	
Security Information and Event Management Hardware and software instruments for SIM (Security Information Management) and SEM (Security Event Management) aimed to the analysis of security alerts, tracking log and generation of management and audit reports	
Framework for security documentation Definition of Business Continuity and Disaster Recovery Plan; periodic verification of the functionality of the plans, compliance assurance of schemes to organizational methodologies and best practices for safety; awareness on issues of information security and service continuity	
Data security Hardware and software solutions useful to minimize the risk of loss of integrity requirements, availability and confidentiality of data managed by the individual workstations as well as from large repositories of data in the Data Center	
Perimetral protection Hardware and software solutions implemented to protect the logical boundaries of the company from possible network intrusions by unauthorized individuals	
Antifraud	
Security certifications	

³³ The Community cloud model provides the sharing of infrastructure among different companies in a community with common interests. For a banking group, the cloud used by the banks is a community cloud only if it is also used by individuals outside the group.

 ³⁴ The Hybrid cloud model combines in a single cloud solution two or more different models (public, private or community). For example, if an institution uses a cloud service offered by combining a public and a private part, the answer is Hybrid cloud. If an institution uses two different cloud services, one private and one public, should mark the two boxes Public and Private but not the Hybrid.

25 Indicate, for IT and group employees, the total number at 31.12.2011 and the monthly average.

	Total number at 31.12.2011	Yearly average of monthly values
IT employees		
Group employees		

26 With reference to 31.12.2011, indicate the breakdown of group IT staff by role and age.

	Less than 35 years	From 35 to 50 years	More than 50 years	Total by role
Clerks				
Middle management				
Senior management				
		To	tal IT employees	

27 Again, with reference to 31.12.2011, indicate the breakdown of group IT staff by role and gender.

	Men	Women	Total by role
Clerks			
Middle management			
Senior management			
		Total IT employees	

28 Are there any reference standards used for IT skills and professional profiles?

- 1. Yes
- 2. No

_	Selection of personnel	Training of personnel	Acquisition of external resources
Reference Standard e.g. EUCIP, eCF, ECDL, AITTS, SFIA, CIGREF			
Certification of Products e.g. operating systems, application software, ERP			
Certification of Methodologies e.g. ITIL			

29 Specify the percentage of group's employees which benefits of company's mobile devices.

- 1. Null o negligible
- 2. Below 10%
- 3. Between 10% and 25%
- 4. Between 26% and 50%
- 5. Over 50%

Laptop	
Tablet	
Smarphone	

30	Can	group's	employees	use	their	personal	mobile	devices	(laptops,	tablets	and
	smartphones) for working activities?										

1. Yes	
2. Yes, in selected cases ³⁵	
3. No	

31 What are the main items of concern associated with the use of personal mobile devices for working activities? Rank the items in decreasing order of importance (1 – most important) omitting those not observed and without repeating any values.

	Security/Integrity of Company's Systems	
	Loss of Company's Data	
	Maintenance and change management costs	
	Policy of treatment of personal data and privacy	
	Definition of Unions agreements	
Other, specify:		

³⁵ E.g. for some professional roles or specific work reasons.

Technological environments (Question 21)

Contactless

Technologies that permit the interaction of two or more entities without physical contact, for example for recognition applications. Typical contactless technologies are RFID (Radio Frequency IDentification) and the more recent NFC (Near Field Communication). The response to this question must be assessed regardless of whether the technology is integrated in mobile devices (e.g. an NFC smart card integrated in a smartphone).

Biometric recognition systems

Systems able to identify people by recognizing biological or behavioural features (e.g. fingerprints, colour and size of the iris, physiognomy of the face, voiceprints, signatures).

Mobile applications

Mobile is taken to mean all devices known as handheld, that is small mobile terminals that allow users to carry out operations previously possible only with PCs (e.g. cellular phones, smartphones, palmtops and PDAs but not portable PCs). Mobile applications can be used from either inside or outside the company and be aimed at either customers or staff.

Social networking

Online service, platform, or site that focuses on facilitating the building of social networks or social relations among people who share interests, activities, backgrounds, in the working life and/or real life connections.

Business intelligence

The set of corporate and technological processes for gathering and analyzing strategic information, transforming data and information into "knowledge". In general, data are collected and analyzed in order to inform management decisions – Decision support systems – in the various business sectors and for management control.

The following are examples of business intelligence: benchmarking internal operations, data presentation applications for customer interfaces, management dashboards.

Big data

Data sets so complex and large that they become hardly managed by standard software, and therefore require more complex systems and innovative technologies. Data can come from social networks, sensors, image, mobile devices, etc. .. and are generally used for analyzing multi-dimensional features.

Cloud computing

The term cloud computing indicates a set of information technologies enabling the use of resources – hardware (storage, CPUs) and software – accessed remotely as if they were implemented by "standard" systems (servers or peripheral devices). The actual allocation of the resources is not defined in detail; rather, the idea is precisely that the implementation is a heterogeneous and dispersed set of resources whose characteristics are not known to the user. The following are various types of cloud computing:

- SaaS (Software as a Service) Consists in the remote use of programmes, often through a web server.
- PaaS (Platform as a Service) Similar to SaaS, but rather than the remote use of a single programme, allows that of a software platform that can comprise various services, programmes, libraries, etc.).
- IaaS (Infrastructure as a Service) Consists in the remote use of hardware services the resources are used on request, when required.

VoIP

A technology that makes it possible to have a telephone conversation over the Internet or some other dedicated network based on IP. For example, VoIP telephony for the staff, VoIP software on employees' PCs (in place of traditional telephonic communications), interactive customer service via VoIP.

Web Conferencing

A system of videoconferencing via the Internet using software installed on participant's terminals or a web application with additional functions, such as the presentation of slides, the projection of videos, voting among the participants, web tours, etc. The presence of this technology is to be reported only when it is considered an organizational tool.

Service Oriented Architecture (SOA)

SOA technologies are based on the presentation of functionalities via standardized interfaces so that individual applications can be used as components of internal or business processes and users' requests satisfied in an integrated and transparent manner. An example of a SOA application is a home banking portal connected to a "customer and/or order acquisition" service, regardless of how this is done (languages, vendors, standards, etc.).

Green IT

The use of environmental criteria to assess and select IT services and equipment. The environmental criteria examine the impact of IT equipment and services on the environment for their entire life cycle; the evaluative parameters include direct and indirect energy consumption - primary energy and air conditioning – and the possibility of recycling the components. The following are examples of green IT: investment in energy-efficient hardware and the virtualization of servers and storage.