COCIR eHEALTH TOOLKIT

FOR AN ACCELERATED DEPLOYMENT AND BETTER USE OF eHEALTH MAY 2011

COCIR

SUSTAINABLE COMPETENCE IN ADVANCING HEALTHCARE

European Coordination Committee of the Radiological, Electromedical and Healthcare IT Industry

TABLE OF CONTENTS

WHY eHEALTH MATTERS TO COCIR?

As the leading European trade organization in the field of eHealth, representing the Radiological, Healthcare IT and Electromedical industry, COCIR welcomes the European Commission's increasing support for eHealth, a technology which has been gaining ground over the last twenty years and is now recognised as one of the most beneficial tools in the healthcare arena.

While the benefits of eHealth - the use of information and communications technologies (ICT) in the field of healthcare – are not disputed, the eHealth market remains fragmented at both country and regional levels in Europe and is not benefiting from efficient deployment today. Still, times change and the new decade seems to be bringing with it a new and more positive landscape for eHealth.

Since 2007, the European Commission has publicly-recognised ICT's ability to drive the EU economy and indeed its economic recovery in the Europe 2020 vision. The Digital Agenda too sets ambitious goals for the deployment of eHealth and more recently, the Innovation Union promises to launch partnerships to support active and healthy ageing. The eHealth Governance initiative is strengthening cooperation between the Member States and last but not least, the Directive on Patients' Rights in Cross-border Healthcare sets out a legal basis for using eHealth in Europe for the first time.

As an organisation which very much values a partnership approach, COCIR is following these developments closely and is committed to contributing over 20 years of expertise and experience in the field to ensure a better eHealth future for Europe and its citizens.

Nicole Denjoy

COCIR Secretary General

1

COCIR POSITION PAPER

PART 1
COCIR POSITION PAPER 1

COCIR PRIORITIES

COCIR advocates the deployment of Healthcare IT as being crucial for improving healthcare and ensuring the continuum of care as stated in COCIR's **WHITE PAPER**[1] towards a sustainable healthcare model.

In 2007, COCIR developed **10 RECOMMENDATIONS**[2] to accelerate the deployment of eHealth. Given the constant evolution in this domain and ongoing debates, COCIR has concentrated its efforts on three major priority areas out of the 10 recommendations for a dynamic healthcare IT market in Europe.

THE FOLLOWING THREE PRIORITIES WILL ACCELERATE THE DEPLOYMENT OF EHEALTH IN EUROPE

1 **DEVELOP AN INNOVATIVE SUSTAINABLE BUSINESS MODEL**
- a) Consider eHealth as a worthwhile investment, not as a cost
- b) Measure the non-financial impact of eHealth to make informed funding decisions
- c) Finance the deployment of eHealth
- d) Develop reimbursement mechanisms for eHealth services

2 **FOSTER STANDARDS AND INTEROPERABILITY**
- a) Foster international standards
- b) Foster user and market-driven standards
- c) Promote interoperability at EU and international level
- d) Reduce the regulatory burden

3 **ENABLE MARKET DEVELOPMENT**
- a) Bring legal clarity
- b) Build IT skills among healthcare professionals
- c) Empower patients and boost patient-centric healthcare systems

1 COCIR White Paper "Toward sustainable healthcare model" (November 2008)
http://cocir.org/uploads/documents/-34-cocir_wp_on_sustainable_hc_-_released_on_19_nov._2008.pdf

2 COCIR "Ten Recommendations on eHealth" (October 2007)
http://www.cocir.org/uploads/documents/-24-cocir_pp_ehealth_rel_short.pdf

DETAILED BRIEFING

WHAT IS eHEALTH?[3]

› eHealth describes the application of information and communications technologies across the whole range of functions that affect the health sector.

› eHealth includes tools for health authorities and professionals as well as personalised health systems for patients and citizens.

› eHealth can therefore be said to cover the interaction between patients and health-service providers, institution-to-institution transmission of data, or peer-to-peer communications between patients and/or health professionals. It can also include health information networks, electronic health records, telemedicine services, and personal wearable and portable communicable systems for assisting in the prevention, diagnosis, treatment, health monitoring and lifestyle management of patients.

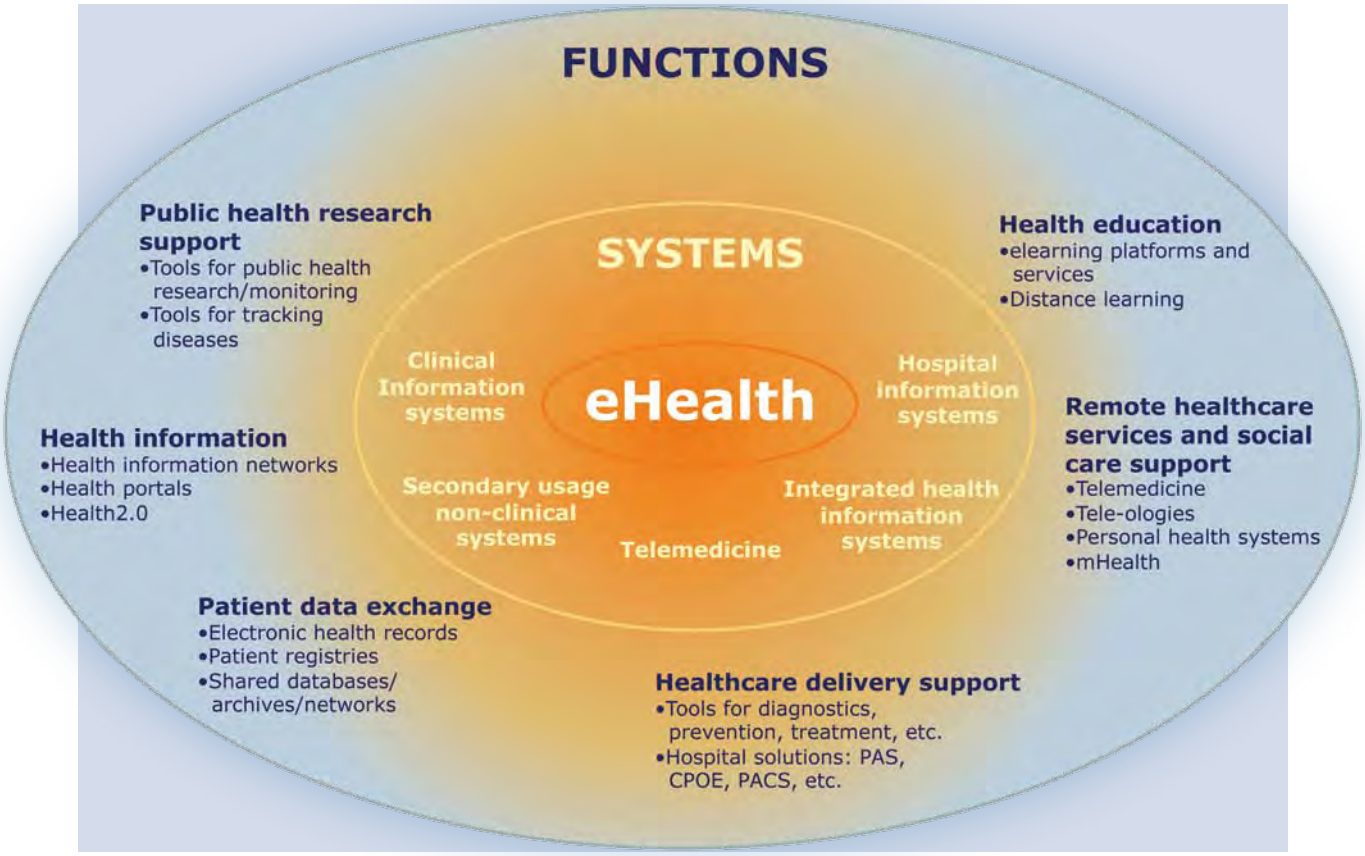
eHEALTH COMPRISES FIVE TYPES OF SYSTEMS:

› Hospital information systems (HIS)
› Clinical information systems (CIS)
› Telemedicine
› Integrated health information networks
› Secondary-usage non-clinical systems

eHEALTH COVERS THE FOLLOWING FUNCTIONS:

› Data exchange
› Health education
› Health information
› Public health research support
› Healthcare delivery support
› Remote healthcare services social care support

eHealth is the application of ICTs across the whole range of functions that affect the health sector.
It encompasses five types of systems and covers various functions:



3 See COCIR Glossary of terms

BENEFITS OF eHEALTH

The benefits of eHealth are widely recognised. The European Council Conclusions[4] on 'Safe and Efficient Healthcare through eHealth' (December 2009) recognise "the importance of eHealth as a tool to improve quality and patient safety, to modernise national healthcare systems, to increase their effectiveness and make them better adapted to meet the individual needs of patients, health professionals and the challenges of an ageing society".

Below is a non-exhaustive list of the recognised benefits of eHealth.›

› 1 Facilitate access to healthcare

eHealth can help deliver care to people located in remote places and who do not have access to a hospital, for example through a tele-consultation.

› 2 Improve quality of care

eHealth can help improve the quality of care by providing easier, safer and faster access to patient data, thereby allowing the healthcare professional to access the right data at the right time and make an informed-based diagnosis.

› 3 Improve quality of life of patients

eHealth in general and telemedicine in particular can help improve the quality of life of patients by, for example, monitoring the condition of the patient at distance at home, rather than in a hospital. This is particularly relevant for elderly, chronically ill persons and people living in remote regions.

› 4 Improve patient safety

The availability of information on the patient – such as his medical history, past diseases and interventions, allergies, reaction to medications – in an electronic health record (EHR) allows healthcare professionals to deliver a treatment tailored to the needs of the patient and thereby reduce risks of complications, adverse drug reactions etc.

› 5 Save time for healthcare professionals and responds to the shortage of qualified staff

Adequate eHealth tools such as electronic health records allow healthcare professionals to access information on the patient faster and thereby avoid losing time compiling information from different location/sources. By allowing healthcare professionals to save time, eHealth tools also address the issue of shortage of healthcare professionals. With the increase of chronic diseases and the ageing population, healthcare professionals will be required to monitor more patients. eHealth tools can help them work more efficiently, by storing patient information in a single location, taking medical decisions better and faster with the support of decision support systems.

› 6 Save costs

eHealth can help reduce costs (clinical and administrative costs) by, for example, avoiding the duplication of medical examinations and unnecessary visits to the general practitioners / hospitals.

› 7 Modernise and improve efficiency of healthcare delivery

Integrating eHealth in healthcare delivery brings a degree of sophistication to healthcare systems by allowing a faster flow of information and helping transform healthcare systems, from a fragmented approach (prevention, primary care, treatment, rehabilitation) to a seamless continuum of care where all these levels are closely interlinked.

› 8 Improve and secure transfer of patient information

Where patient data used to be stored on a hand-written piece of paper handled by nurses, doctors and administrative staff, it is now stored on a centralised electronic file, protected with adequate identification and authentication processes.

› 9 Reduce carbon footprint of healthcare

By using information technologies, eHealth allows the move from paper-based to electronic files. eHealth also reduces the need for travel for patients, healthcare professionals and other actors resulting in lower CO2 emissions.

› 10 Contributes to the competitiveness of the EU economy

eHealth is the fastest growing health sector in Europe and contributes to the creation of jobs and to the innovation capacity of the European economy, as recognised by the EU2020 strategy.

4 Council Conclusions "Safe and Efficient healthcare through eHealth" (December 2009)

DETAILED BRIEFING ON THE THREE PRIORITIES

1 DEVELOP AN INNOVATIVE SUSTAINABLE BUSINESS MODEL

CHALLENGES

eHealth is an important tool to achieve the sustainability of healthcare systems, but an innovative business model for eHealth is needed urgently.

The WHO Global Observatory on eHealth[5] report stresses that "even the most progressive eHealth policies are at risk if not supported by an adequate and complementary funding environment". The current payment systems often do not encourage care providers to invest in eHealth and do not reward providers for improving quality of care via ICTs. In addition, the costs and benefits of adopting new technologies are not shared equally among the stakeholders: investments which are cost-effective from the point of view of the system as a whole are therefore not automatically going to be undertaken. Reducing the financial barriers, shifting or sharing the financial risks and providing more evidence on the benefits of eHealth can accelerate the adoption of eHealth.

COCIR PROPOSALS

a) Consider eHealth as a worthwhile investment, not as a cost

The lack of funding is a major barrier to eHealth deployment. According to the WHO report on eHealth[6], public funding is by far the biggest source of finance for eHealth. However, as government budgets are continually stretched, eHealth must compete with other public services for its share of limited resources. In order to win such funds, governments must be convinced that money allocated to eHealth will not only improve health services in the short-term, but will be a solid investment for the future healthcare system and that the expected benefits will outweigh the cost.

Examples of the economic benefits of eHealth include minimising the duplication of medical tests, reducing the administrative cost of billing, patient scheduling, and paper forms, reducing time spent collecting patient information, improving staff productivity and increasing healthcare efficiency (through reduced utilisation of healthcare services)[7].

Canada Infoway estimates that the creation of electronic health records for all Canadians will cost about $10 billion - which translates to a one-time cost of approximately $350 per Canadian - while the estimated savings to the Canadian healthcare system will amount to $6 to $7 billion a year, every year[8]. However, the time anticipated between the initial investment and the actual savings are made is still unclear.

Many studies point to the fact that the return on investment is not immediate – it can take a few years to materialise - and is difficult to anticipate.

The shortage of robust studies documenting the economic benefits and cost-effectiveness of eHealth is a challenge. Industry encourages governments and payers to finance such studies and to study existing evidence when considering investments on eHealth.

b) Measure the non-financial impact of eHealth to make informed funding decisions

The scale of most eHealth projects and the important sums of taxpayers money invested in them, make it crucial for governments and payers to evaluate the impact of eHealth programmes.

The Report of the Swedish Presidency of the EU 'eHealth for a Healthier Europe'[9] recognises three major non-financial benefits of eHealth: improved patient safety, improved quality of care and improved accessibility of care. Collecting evidence on the non-financial benefits of integrating eHealth in healthcare systems should therefore be a crucial part of decision-making.

---

5 Building Foundations for eHealth: progress of member state: report of the Global Observatory for eHealth, WHO, 2006

6 Idem

7 Improving Health Sector Efficiency – the Role of information and communication technologies, OECD health policy studies, 2010

8 Canada Health Infoway, http://www.knowingisbetter.ca/#faq

9 eHealth for a Healthier Europe! Opportunities for a better use of healthcare resources, Gartner, 2009

The lack of data on the benefits of eHealth is a major barrier to its widespread adoption. Industry encourages governments and payers to support independent and reliable evaluation of eHealth programmes and, in parallel, to engage in the deployment of eHealth on the basis of existing evidence and successful projects.

c) Finance the deployment of eHealth

Large scale deployment of eHealth in Europe requires political will and funds. Politicians need to explore new avenues to finance the integration of eHealth in healthcare systems. COCIR recommends exploring the following three options:

- Improving public procurement

Procurement policies directly impact the funding available for eHealth systems and services. They can streamline ICT business processes and can lead to significant cost savings, while feeding a fruitful dialogue with the providers. The eHealth industry has considerable experience in analysing procurement strategies to see what works and what does not and is happy to initiate a dialogue with the public authorities to devise a strategy on how to accelerate the deployment of eHealth through innovative and efficient procurement strategies.

- Financial incentives to support the adoption and use of eHealth

A general practitioner will hesitate before investing money in electronic health records, and will be reluctant to spend time updating patient files if this additional work does not generate additional income.

A recent study by the OECD[10] demonstrates that financial incentives are critical in promoting the implementation and effective use of eHealth tools: grants, subsidies, bonuses or add-on payments that reward providers for adopting eHealth are effective, in particular in countries where physicians are remunerated on a fee-for-service basis. However, a one-off subsidy will support the initial set-up phase but will not encourage the ongoing use of eHealth. A reflexion is needed on what steps should be taken to ensure that the ongoing costs of eHealth systems are being met with sufficient funding, and that those who bear the financial investment (implementation and maintenance) also see a return on investment.

In 2009, the United States adopted an incentive programme to support the adoption of eHealth by the healthcare sector over the following five-year period. The industry recommends that the European Union and Member States closely monitor the impact this stimulus plan has on the eHealth market and draw learnings to be applied to the EU market.

- Finance eHealth through the Structural Funds

With national budgets under pressure, authorities need to find additional resources to support the implementation of eHealth in Europe. The healthcare IT industry recommends that authorities earmark a significant share of Structural Funds to finance eHealth deployment on the EU market for the forthcoming financial perspective 2014-2020. This dialogue needs to involve all relevant stakeholders: EU institutions, regional and national authorities, patients, healthcare professionals, care providers etc and should be part of the discussions within the eHealth governance initiative.

d) Develop reimbursement mechanisms for eHealth services

Most current reimbursement schemes do not cover eHealth-based services: for example an online consultation or a discussion at distance between two healthcare professionals on a patient's case. Medical professionals are not encouraged to make use of eHealth, even if this could result in improved quality of care for their patients and savings for the healthcare system.

This is a critical barrier to the use of eHealth: a new approach is needed to integrate eHealth in routine reimbursement schemes. Public authorities need to be ready to incentivise and reimburse more outcome-based care processes covering the entire care value chain.

Different systems have been tested in different countries, such as:

- Payment differentials: bonuses and add-on payments that reward providers for adopting IT in relation to quality improvements targets (pay for performance)
- Direct reimbursement of eHealth-based services
- Tax incentives
- Financial penalty for not using IT

10 Improving Health Sector Efficiency – The role of Information and Communication Technologies, OECD, 2010

Evidence shows that each of these mechanisms - either used in combinaison or separately - have a positive effect on the adoption and use of healthcare IT, but have not yet been tested on a sufficiently large scale and for long enough to considered a sustainable business model. Industry therefore strongly encourages further research in this area.

2 FOSTER STANDARDS AND INTEROPERABILITY

Foster international user-driven standards and profiles for eHealth interoperability, and leverage self-declaration of interoperability performance based on conformance testing processes.

CHALLENGES

Standards are necessary to secure three crucial aspects of eHealth: interoperability, patient safety and privacy. These are pre-requisites for the development of eHealth in Europe.

Additionally, standards have a strong impact on eHealth costs, as the process of transferring data between different systems responding to the same standards becomes more economical.

However standard setting is a complex activity, which does not always address market needs. Standards can be complex to implement and the lack of interoperability standards and profiles contributes to market fragmentation in Europe, with its many small, differentiated markets. This inevitably results in a lack of economies of scale for companies which offer eHealth-related goods and services. This in turn leads to higher costs for users, and a slow take-up of eHealth solutions as experience is transmitted slowly between markets in different countries.

COCIR PROPOSALS

a) Foster international standards

Standardisation is the process of agreeing on technical specifications, criteria, methods, processes, or practices with a view to secure compatibility, interoperability, safety, repeatability and other related qualities. Standards are therefore the best way to guarantee innovation and open access to the market for users and industry. This creates a level playing field which strengthens competition for the benefit of consumers and the competitiveness of European industry in the global market.

This 'virtuous cycle' can be hindered by the existence of national or local standards. To access a national market, companies are often obliged to adapt their products to the national requirements, creating additional costs for the industry and for the healthcare system as a whole. The healthcare IT industry therefore advocates for international standards to enable manufacturers to reuse existing solutions which allow for the reduction of costs in the design, development and deployment of products.

In this regard, COCIR welcomes the Digital Agenda's objective to foster EU-wide standards by 2015, but encourages the Commission to go one step further towards international standards.

b) Foster user and market-driven standards

Industry advocates that standards should be user-driven and market-driven to be effective. All too often, the standard development process is too slow and market-agnostic. Many published standards do not fulfil the requirements of the market players and users, as technology and users' wishes have moved along.

c) Promote interoperability at EU and international level

Interoperability is the ability of systems and organisations to work together[11]. In the last years, many eHealth programmes have been implemented in various regions in Europe without coherence, hence resulting in a myriad of small-scale systems based on local standards which cannot communicate with each other. The lack of interoperability is a major barrier to the development of eHealth in Europe. COCIR therefore applauds the numerous initiatives taken by the European Commission and Member States to improve interoperability[12] in Europe and would like to draw the Commission's attention to IHE.

Integrating the Healthcare Enterprise (IHE) plays an important role by publishing standardised profiles for healthcare IT interoperability scenarios. IHE is a user-vendor initiative which develops and publishes detailed frameworks for implementing relevant eHealth workflows to meet specific healthcare needs. IHE supports interoperability testing, demonstration and educational activities to promote the deployment of these frameworks by vendors and users. The profiles that IHE generates are internationally accepted and recognised as "state of the art" in the context of eHealth. IHE organises annual Connect-a-thons, which are multi-vendor interoperability testing sessions. Proven experience with these IHE conformity testing process before and during IHE Connect-a-thons makes IHE an important best practice for European policymakers to consider. To pursue these activities, IHE engages numerous stakeholders, including care providers, medical and IT professionals, professional associations and vendors.

COCIR welcomes the Digital Agenda's objective to foster interoperability testing by 2015 through stakeholder dialogue, and encourages the Commission and Member States to recognise in a European interoperability framework a core set of IHE profiles.

COCIR recommends that clear requirements for internationally recognised standards and profiles for interoperability be included in public procurement policies. This applies to EU funds as well (FP, CIP, structural funds).

COCIR also encourages the European Commission to maintain its support for the development of semantic and functional interoperability, based on real applications from large-scale pilot projects in a first phase, and to support large-scale implementation in a second phase.

d) Reduce the regulatory burden

A balanced and efficient regulatory approach is needed to allow for innovation but also to create confidence among customers. Industry recommends a prudent use of regulatory initiatives in the areas of certification and interoperability conformity testing in order to minimise additional regulatory burdens.

COCIR recommends developing interoperability conformity testing and certification as related but independent activities.

In the area of **interoperability conformity**, COCIR recommends leveraging the long experience of the industry applying self-declaration of interoperability conformance based on the proven IHE experience and conformity testing processes.

In the area of **certification**, COCIR encourages public or private certification entities to make use of the openness of IHE's flexible and proven solutions to adapt conformity testing to local needs. Certification processes carefully consider audit programmes of the quality system of the vendor based certification as a superior alternative to third party certification. If third party certification entities are created, those should not be regulated entities, but market driven voluntary programmes.

Last but not least, in order to preserve market dynamics and to ensure innovation the governmental focus lies on involvement in becoming a partner in the public/private certification process, linked to interoperability conformance testing activities.

In the area of data protection, COCIR encourages the certification of security procedures, based on industry best practice (e.g. ISO2700x-family) and recommends using public/private certification auditors for these certification activities.

11 See COCIR eHealth Glossary of Terms for more definitions.

12 Commission action plan on eHealth (2004), Commission's report on 'Connected Health' (September 2006), Commission's communication on eHealth interoperability (2007), the Lead Market Initiative (2007), the Commission's communication on Telemedicine (2008), the epSOS large scale project, the Calliope Thematic Network, the Digital Agenda (2010), article 13 of the directive on patients' rights in cross-border healthcare (2010) and the eHealth Governance Initiative.

3 ENABLE MARKET DEVELOPMENT

Enable the creation of a competitive eHealth market across Europe by removing institutional, legal and social barriers.

CHALLENGES

eHealth is the fastest growing industry of the healthcare sector. COCIR estimates the global eHealth market at €55 billion of which Europe represents one third. All market players and observers agree that eHealth is set for explosive growth but that many factors hinder the development of the eHealth market in Europe.

Besides the lack of an adequate economic model (see section 1) and technical barriers (see section 2), other barriers which hinder the development of the eHealth market include lack of legal clarity, slow adoption of eHealth by healthcare professionals and societal challenges.

COCIR PROPOSALS

COCIR calls for the creation of a single, leading and competitive eHealth market in Europe. This can only be achieved by creating the same market conditions across Europe. This is an enormous challenge and requires open and continuous dialogue involving all stakeholders, from policymakers at national and European level, patients, health professionals to payers and industry.

a) Bring legal clarity

eHealth is a fast-moving technology which is evolving faster than legislation. This results in legal uncertainties which hinder the adoption of eHealth solutions.

Healthcare professionals and patients will not have confidence in and will not use eHealth if they cannot refer to a comprehensive and clear legal framework covering –among others – the liability of healthcare professionals, rights of patients, responsibilities in case of cross-border healthcare, data protection, licensing and accreditation of healthcare professionals, etc.

Regarding data privacy[13], a balanced approach to privacy and security is essential to establish the high degree of public confidence needed to encourage the widespread adoption of eHealth, and particularly of electronic health records.

Industry is very conscious of the sensitivity of medical data and has incorporated these concerns in the design of eHealth structures and systems (privacy by design, privacy enhancing technologies etc). However, data protection is a collective responsibility and industry cannot act alone:

- Data protection authorities need to allow the availability of medical data at the point of care to secure patient safety.
- Healthcare providers using ICTs need to implement controls to regulate the adequate and safe use of healthcare information technology.
- Public authorities need to harmonise the different national data protection rules to allow a secure flow of data, increase citizens' confidence and eliminate the current barriers to trade in the internal market.

A genuine dialogue is needed between the different actors to establish reliable and coherent privacy and security frameworks.

b) Build IT skills among healthcare professionals

Health professionals do not always have the necessary IT skills to use eHealth solutions. This results in a limited use of these solutions when they are available[14]. The adoption of eHealth by healthcare professionals is slow. This can be explained –among other things – by resistance to ICT caused by a lack of IT skills and a lack of time to learn how to use these new tools. This lack of understanding should be addressed by embedding IT skills in the medical curriculum and by providing IT training to healthcare professionals and change management training to healthcare managers.

13 See "COCIR contribution to the Communication on Strengthening Personal Data Protection in the EU"

c) Empower patient and boost patient-centric healthcare systems

By facilitating connections between people and systems, eHealth can support the shift from provider-centric care to patient-centric care. However, this can only happen if actors (patients, citizens, physicians, care providers, payers) also adopt this new paradigm and agree to change the way they used to provide and receive healthcare.

With eHealth, patients have far more possibilities to manage their own health instead of relying entirely on the family physician or the local hospital. However this is not always easy in a fast-moving environment. The move from provider-centric care to patient-centric care will only be successful if all actors are fully involved and informed.
Healthcare professionals and care providers need to be part of the change process, involved in each step, and should also find their place and interest in the new process.

Industry feels strongly that the eHealth market will take off once the move towards patient-centric care has made some significant progress.

14 See Part II: Market Intelligence Overview for more detail.

2

MARKET INTELLIGENCE OVERVIEW

HOSPITAL IT MARKET IN EUROPE: FACTS, FIGURES AND RECOMMENDATIONS

PART 2
MARKET INTELLIGENCE OVERVIEW
HOSPITAL IT MARKET IN EUROPE: FACTS, FIGURES AND RECOMMENDATIONS

2

COCIR believes that sharing data on the limited use of Healthcare IT in European hospitals will help policymakers, health professionals and other stakeholders realize there is a gap to be filled and encourage them to invest in Healthcare IT, in order to progress towards a better integrated and sustainable healthcare system. COCIR has therefore developed efforts to provide accurate and reliable data on the availability and use of healthcare IT in Europe, and more particularly in European hospitals.

KEY FINDINGS OF THE COCIR MARKET INTELLIGENCE PROGRAMME:

- In 2008, the European hospital IT market amounted to €2.4 billion, with an expected growth of 4% by 2012
- The healthcare IT market in Europe is hindered by hospitals' limited investment plans for healthcare IT tools
- Healthcare transformation is constrained by the limited and unequal availability of clinical information systems in European hospitals
- Adoption of Healthcare IT by healthcare professionals is slow, which affects the speed of healthcare transformation

DETAILED BRIEFING

1 WHY MEASURING HEALTHCARE IT ADOPTION MATTERS?

All healthcare information technology providers will easily agree that there is a lack of reliable data on the availability and use of Healthcare IT in Europe. COCIR believes that providing data on the availability, use and benefits of Healthcare IT will encourage policymakers, health professionals and other stakeholders to invest in Healthcare IT, and thereby improve and transform healthcare and ensure its long-term sustainability across European countries and beyond.

With this in mind, and building on its 20 years' experience in monitoring the medical imaging market, COCIR launched in 2008 the 'eHealth intelligence' process to monitor the availability, use and investment plans for eHealth in European hospitals[15]. In parallel, COCIR issued the eHealth glossary of terms to provide a clear and comprehensive definition for eHealth and for healthcare IT solutions and services.

2 eHEALTH IN HOSPITALS: A MARKET ON THE INCREASE BUT FACING SIGNIFICANT HURDLES

The Hospital IT market totaled €2.4 billion in 2008, with a 4% growth prospect by 2012 (see table 1). This figure covers healthcare IT solutions used in hospitals: administration information systems, clinical information systems, laboratory information systems and imaging information systems (in the field of radiology and cardiology) in Western and Eastern Europe[16].

TABLE 1 HOSPITAL IT MARKET SIZE IN 2010 IN M€ AND EXPECTED GROWTH AS ESTIMATED BY COCIR

	MARKET SIZE IN 2008 IN M€	EXPECTED GROWTH BY 2012
ADMINISTRATION INFORMATION SYSTEMS	903	2%
CARDIOLOGY INFORMATION SYSTEMS	51	11%
CLINICAL INFORMATION SYSTEMS	735	5%
LABORATORY INFORMATION SYSTEMS	220	3%
RADIOLOGY INFORMATION SYSTEMS	498	4%
TOTAL HOSPITAL IT	2407	4%

Source: *COCIR, Western Europe: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Norway, Portugal, Spain, Sweden, Switzerland, The Netherlands, United Kingdom; and Eastern Europe: Bosnia, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Serbia, Slovakia, Slovenia, Ukraine.*

These figures reveal interesting trends concerning the availability, use and investment plans for eHealth in European hospitals, amongst which:

- Insufficient IT budgets available in European hospitals
- Unequal availability and limited investment plans for clinical information systems
- Slow adoption of healthcare IT by healthcare professionals

15 See the annex for the methodology of the market monitoring programme.

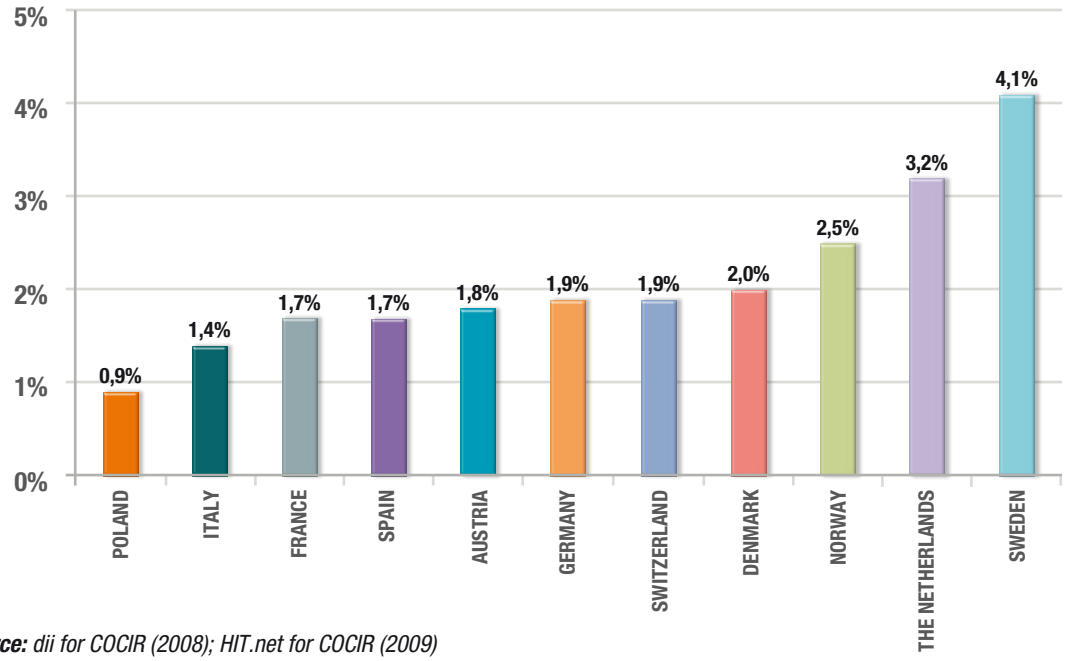
16 Western Europe: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Norway, Portugal, Spain, Sweden, Switzerland, The Netherlands, United Kingdom; and Eastern Europe: Bosnia, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Serbia, Slovakia, Slovenia, Ukraine.

3 HEALTHCARE TRANSFORMATION CALLS FOR HIGHER IT BUDGETS IN EUROPEAN HOSPITALS

a) Facts and figures

Hospitals' IT budgets[17] vary from country to country: from 0.9% in Poland to 4.1% in Sweden. Despite these variations, a strong common pattern is the low level of IT budgets compared to other information intensive sectors such as airways and banking. It is worth highlighting that countries with a higher level of clinical sophistication have the highest IT budgets, e.g. the Netherlands and the Nordic countries (see Graph 2).

GRAPH 2 IT BUDGET AS % OF TOTAL HOSPITAL BUDGET PER COUNTRY

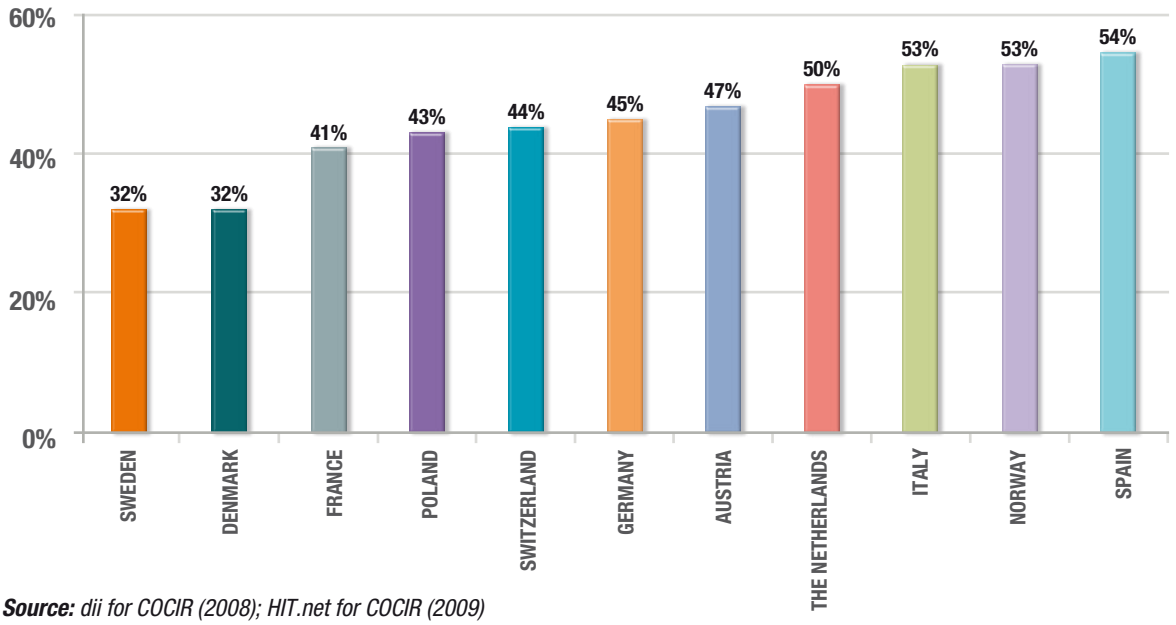


Source: *dii for COCIR (2008); HIT.net for COCIR (2009)*

Another strong common pattern is the limited share of hospitals' IT budget for external IT purchases (hardware, software, technical and professional services). Hospitals' external IT budget range from a maximum of 54% in Spain to 32% in Denmark and Sweden. These figures reflect the low level of external IT expenditures of European hospitals (see Graph 3).

17 Operational and investments as a percentage of total hospital revenues

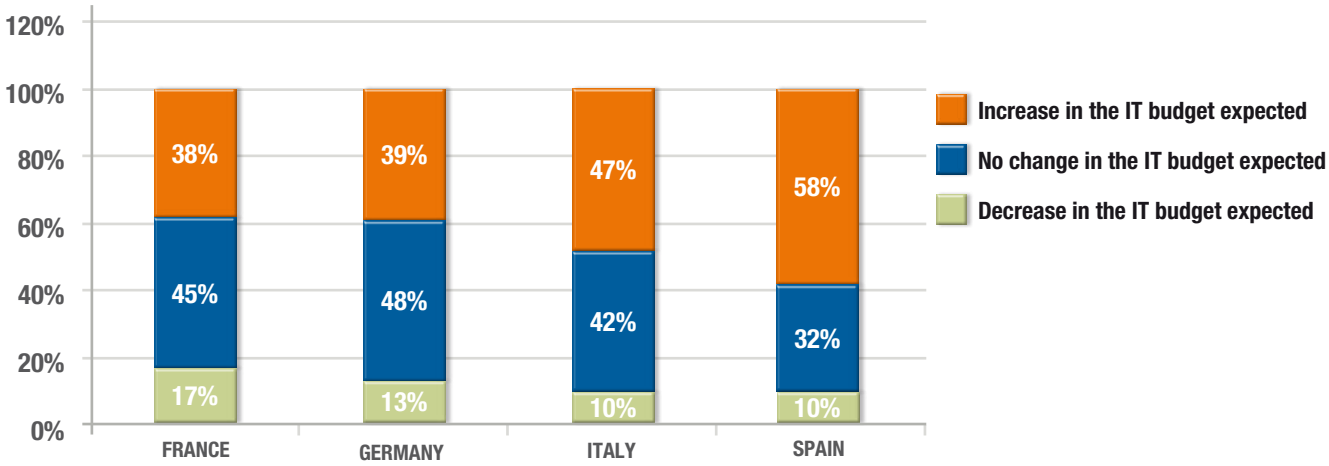
GRAPH 3 EXTERNAL IT BUDGET AS % OF TOTAL HOSPITAL IT BUDGET PER COUNTRY



Source: *dii for COCIR (2008); HIT.net for COCIR (2009)*

Hospitals have different views on the evolution of their IT budget. In answer to the question 'How do you see your IT budget evolving for the next three years', 45% of Hospital CIOs[18] in France and 48% in Germany did not expect any change to their IT budget, while 38% and 39% respectively expected an increase. The reverse trend was observed in Spain and Italy (see Graph 4).

GRAPH 4 EXPECTED EVOLUTION OF HOSPITALS' IT BUDGETS OVER THE PERIOD 2008-2012

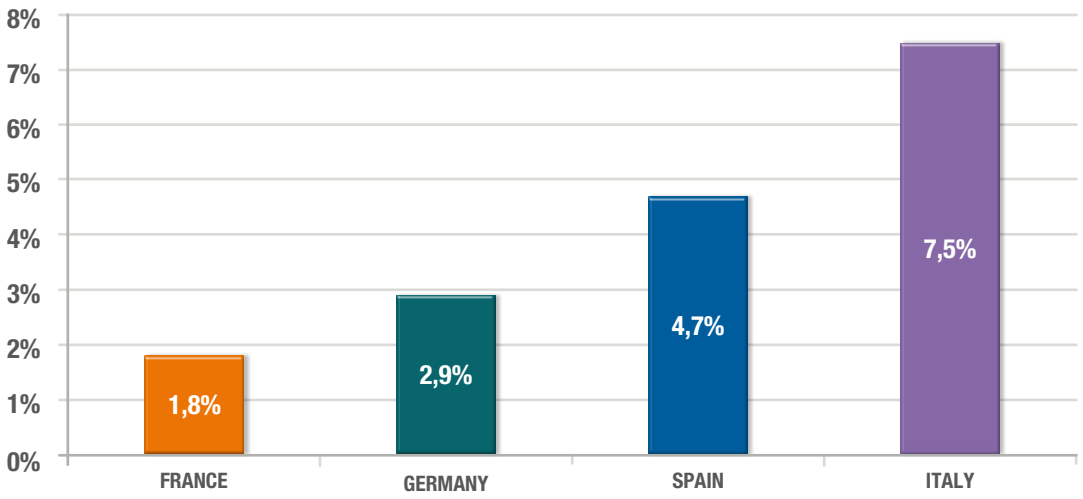


Source: *dii for COCIR (2008); HIT.net for COCIR (2009)*

18 Chief Information Officer

Overall IT budgets in European hospitals are expected to rise but in a very contained way, ranging from 7.5% in Italy, 4.7% in Spain to 2.9% in Germany and 1.8% in France (see Graph 5).

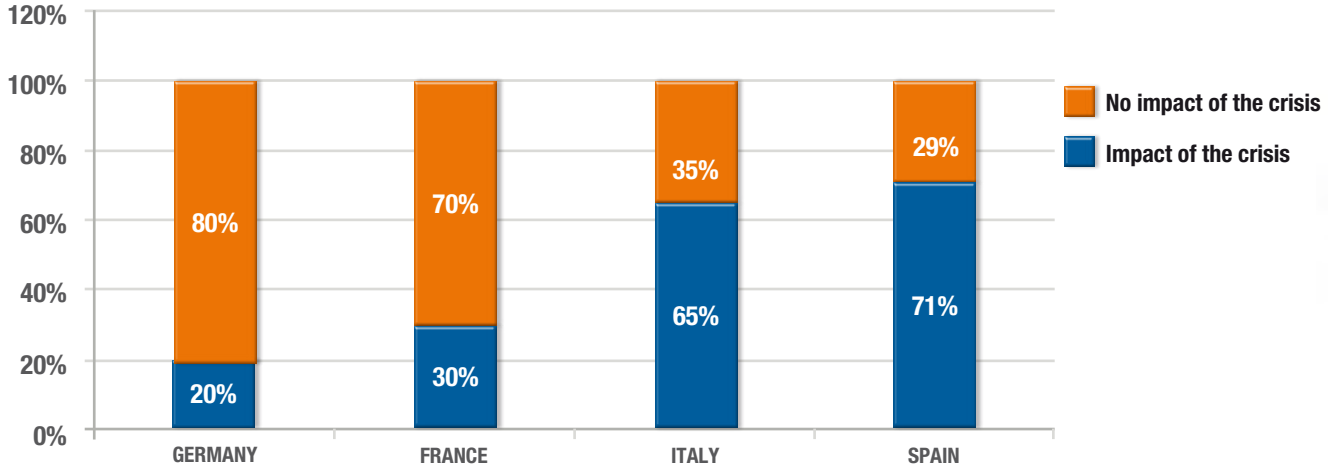
GRAPH 5 EXPECTED GROWTH OF HOSPITALS' IT BUDGETS OVER THE PERIOD 2008-2012



Source: *HIT.net for COCIR (2009)*

The survey shows that the current economic downturn cannot explain the low level of investment in IT nor the moderate growth prospects. For the vast majority of the hospitals surveyed in various countries, the current economic recession has a very limited impact on their current IT budget with the exception of Italy and Spain where 65% and 71% of hospitals surveyed reported a direct impact. (see Graph 6).

GRAPH 6 PERCEIVED IMPACT BY HOSPITALS CIOS OF THE ECONOMIC DOWNTURN ON IT INVESTMENT IN EUROPEAN HOSPITALS



Source: *dii for COCIR (2008); HIT.net for COCIR (2009)*

b) Situation analysis and COCIR proposal

Government objectives for healthcare transformation and the provision of seamless healthcare imply the availability of adequate healthcare IT tools. Today's limited IT budgets combined with limited growth prospects delay the deployment of these innovative tools in hospitals and thereby delay the healthcare transformation called for by doctors, patients, insurers and industry.

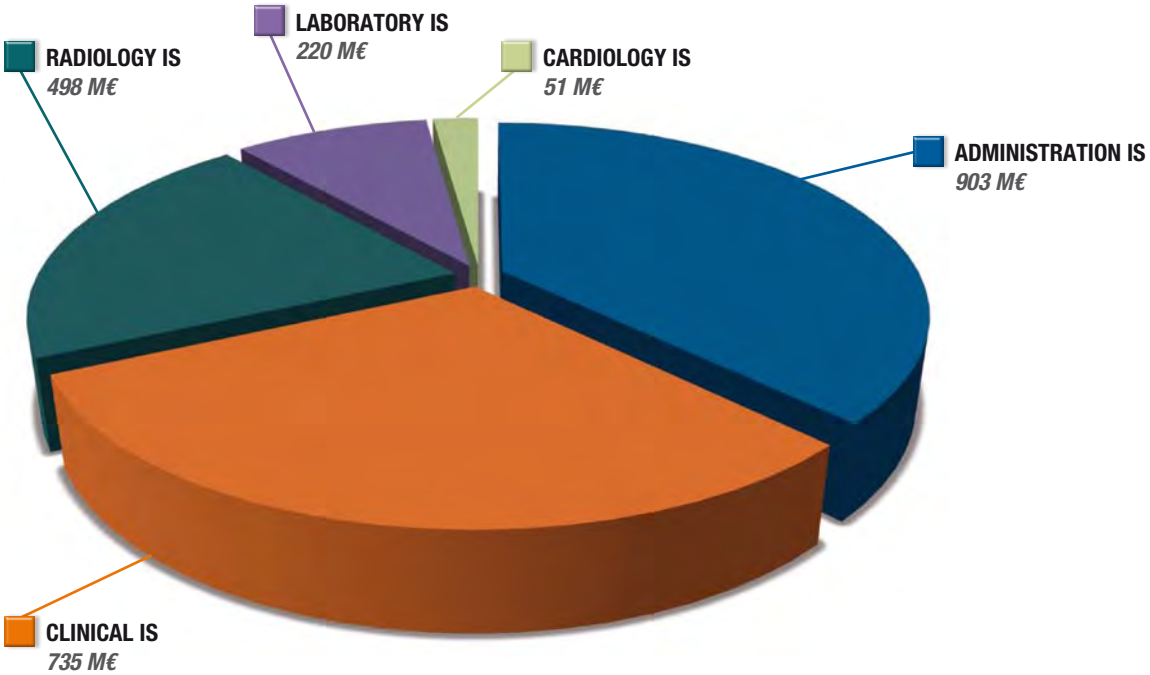
Policymakers have a role to play. Healthcare IT requires the political will to invest sufficient resources in efficient healthcare support systems. For more detailed recommendations see COCIR's recommendations to develop an innovative economic model for eHealth (see page 7).

4 HEALTHCARE TRANSFORMATION CALLS FOR MORE INVESTMENT IN CLINICAL INFORMATION SYSTEMS IN EUROPEAN HOSPITALS

a) Facts and figures

The availability of Clinical Information Systems[19] (Clinical IS) is insufficient. From a total Hospital IT market of €2.4 billion in 2008, Clinical IS represented only 31%, a value of €735 million (see Graph 7). This is particularly low in comparison to Administrative Information Systems, which represented more than 37% of the total market, accounting for €903million of the overall spend. Without taking into account service departments such as Laboratory Information Systems and Radiology Information Systems, the availability of Clinical IS remains low considering its significant potential to improve healthcare delivery efficiency.

GRAPH 7 HOSPITAL IT MARKET PER MARKET SEGMENT IN 2008 IN M€



Source: *COCIR eHealth Intelligence Focus Group (2009) including Western Europe: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Norway, Portugal, Spain, Sweden, Switzerland, The Netherlands, United Kingdom; and Eastern Europe: Bosnia, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Serbia, Slovakia, Slovenia, Ukraine.*

19 e.g. electronic patient records, radiology information systems, computerised physician order entry, decision support information systems, etc. See the Glossary of terms for a more detailed definition.

The availability of Clinical IS is uneven both at the application level and across countries.

Laboratory departments are overall well-equipped with IT systems (with 100% of laboratory departments in French hospitals equipped and 90% in Italy) but less than 1% of hospitals in France, Germany, Italy and Spain are equipped with **medical decision support systems** (see Table 8).

Electronic Patient Record Information Systems are available in at least 50% of hospitals across major European countries with the exception of France ranking behind with 35%. However, while the availability of EPR systems is on the rise, their use by medical professionals is still insufficient, as is documented in the next section.

The availability of **Radiology Information Systems** also varies from country to country. Some countries are well-equipped (e.g. Germany with 70% of hospitals equipped), while other countries show a 60% equipment rate (Italy, Spain) and even 30% in France. COCIR expects this market to grow by 10% over 2012.

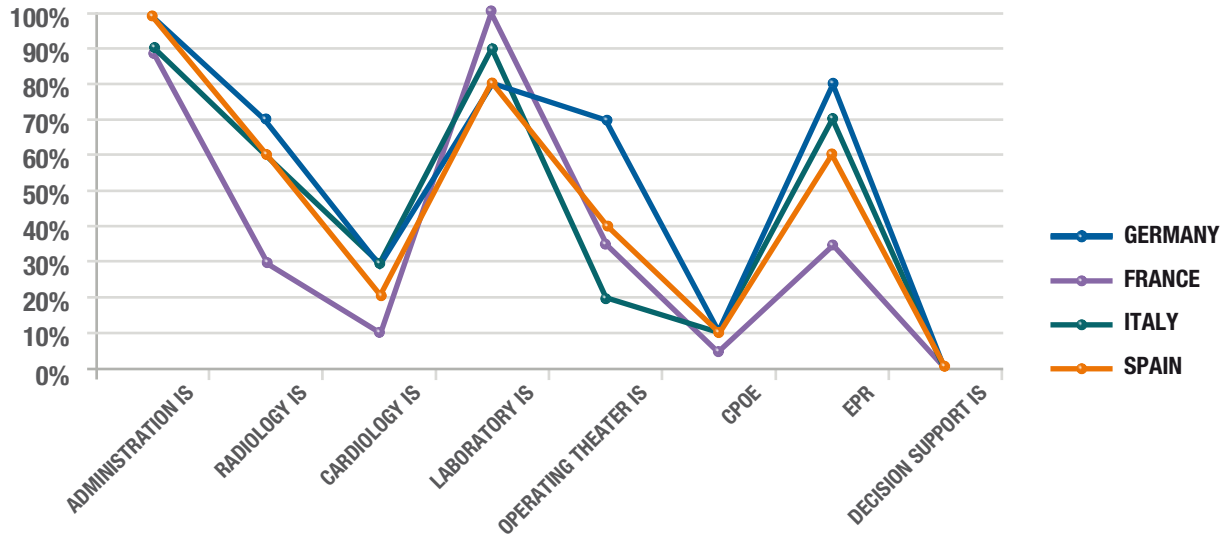
The availability of **Cardiology Information Systems** is still limited, ranging from 10% to 30% of hospitals equipped, but COCIR expects this market to develop on the short/mid-term.

TABLE 8 AREAS WHERE HOSPITALS HAVE IT SYSTEMS IN PLACE (AGGREGATION OF RESPONSES)

	FRANCE	GERMANY	ITALY	SPAIN
ADMINISTRATION IS	90%	99%	90%	99%
RADIOLOGY IS	30%	70%	60%	60%
CARDIOLOGY IS	10%	30%	30%	20%
LABORATORY IS	100%	80%	90%	80%
OPERATING THEATER IS	35%	70%	20%	40%
CPOE	5%	10%	10%	10%
EPR	35%	80%	70%	60%
DECISION SUPPORT IS	<1%	<1%	<1%	<1%

Source: *COCIR eHealth Intelligence Focus Group (2009) based on recalculated universe at service and clinical department level*

GRAPH 9 AREAS WHERE HOSPITALS HAVE IT SYSTEMS IN PLACE (AGGREGATION OF RESPONSES)



Source: *dii for COCIR (2008)*

b) Situation analysis and COCIR proposed action plan

The current level of availability of Clinical Information Systems combined with the level of investment in clinical systems is not enough to deliver the promised improvements in healthcare. Real healthcare transformation cannot happen without scaling up the information capacity at the level of health professionals. In a complex world of continuous medical innovation, information load and rapid change, healthcare professionals need adapted medical decision support tools to help them make the right medical decisions, based on the right information, at the right moment.

Policymakers have an important role to play in encouraging and supporting - including financially - hospitals and other stakeholders towards a wider adoption of Clinical Information Systems. The focus should be on in-depth institutional solutions and clinical richness to allow cross-sharing and decision support at the point of care.

For more detailed recommendations see COCIR's recommendations to develop an innovative economic model for eHealth and to enable market development.

5 FASTER ADOPTION OF HEALTHCARE IT BY HEALTHCARE PROFESSIONALS IS NECESSARY TO REAP THE FULL BENEFITS OF EHEALTH

a) Facts and figures

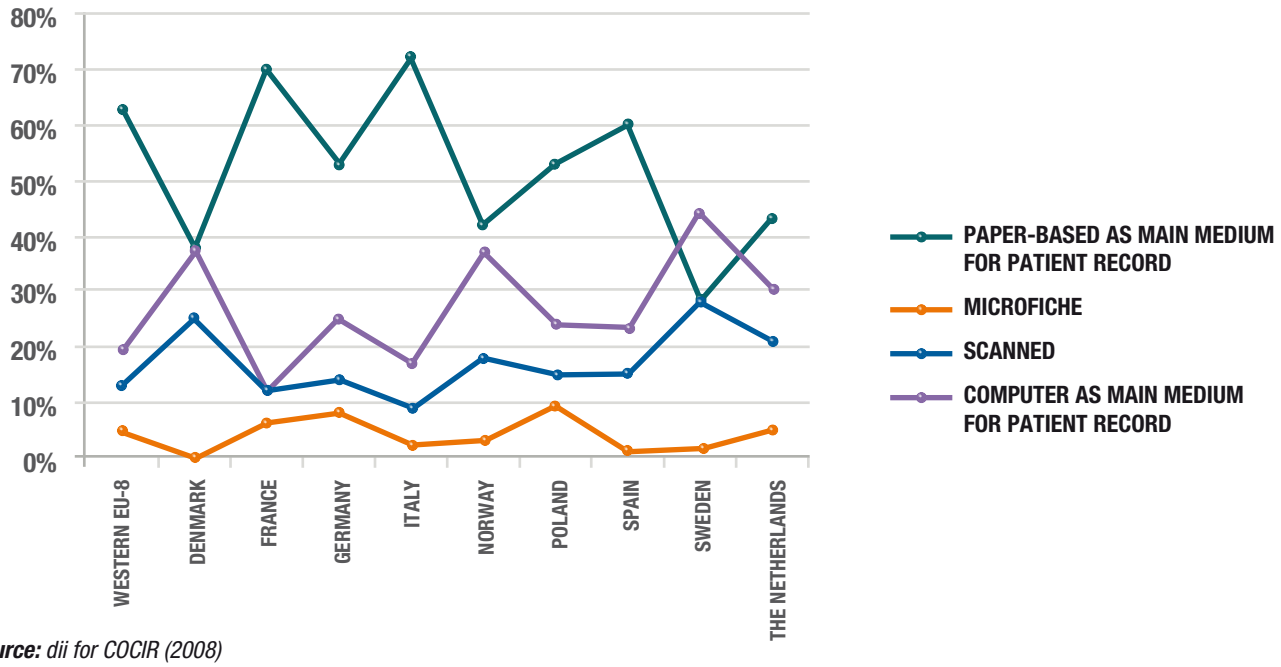
Even if hospitals invest more in Clinical Information Systems, the task is far from accomplished. While overall two thirds of hospitals in Europe have Clinical Information Systems in place, two thirds still rely on paper as their main way of managing patient records. This proves that even when Clinical Information Systems are available, effective use is lagging behind (see table 10).

TABLE 10 HOSPITAL'S MAIN MEDIA FOR STORING AND ARCHIVING MEDICAL RECORDS

	PAPER-BASED AS MAIN MEDIUM FOR PATIENT RECORD	MICROFICHE	SCANNED	COMPUTER AS MAIN MEDIUM FOR PATIENT RECORD
DENMARK	38%	0%	25%	37%
FRANCE	70%	6%	12%	12%
GERMANY	53%	8%	14%	25%
ITALY	72%	2%	9%	17%
NORWAY	42%	3%	18%	37%
SPAIN	60%	1%	15%	24%
SWEDEN	28%	1%	28%	44%
THE NETHERLANDS	43%	5%	21%	31%
TOTAL WESTERN EU-8	63%	5%	13%	19%
POLAND	53%	9%	15%	24%

Source: *dii for COCIR (2008)*

GRAPH 11 HOSPITALS' MAIN MEDIA FOR STORING AND ARCHIVING MEDICAL RECORDS



Source: *dii for COCIR (2008)*

Healthcare IT is not only about technology but also about change and human behaviour. The CIOs interviewed identified two main barriers to the clinical adoption of healthcare IT: healthcare professionals' time constraints and change management issues. **Interestingly, in 19% and 18% of hospitals surveyed in France and Germany, health workers indicated that they did not need Healthcare IT**. This clearly shows a need for more education and building trust and confidence in the benefits of Healthcare IT.

b) Situation analysis and COCIR proposal

Adoption of Healthcare IT is the shared responsibility of policymakers, health professionals and other stakeholders including industry. National and European administrations need to put forward strong scientific evidence on the benefits of Healthcare IT, both at the medical and economic level. The European Commission should support research which demonstrates the benefits of Healthcare IT solutions and services, and address the concerns of healthcare professionals. It should coordinate efforts at international level in partnership with professional medical associations (e.g. medical guidelines decision-makers).

For more detailed recommendations, see COCIR's recommendations to develop an innovative economic model for eHealth (see page 7) and to enable market development. (See page 11)

Annex: COCIR market research methodology

The figures provided in this paper are based on a survey of CIOs (Chief Information Officers) from acute care hospitals in Europe. CIOs were interviewed on the availability, use, replacement and investment plans for fourty-one information systems in their hospital.

The data collected through the survey is analysed by COCIR members.

The methodology was tested through a pilot project in 2008. The ongoing research programme started in 2009 with a focus on seven countries: Germany, France, Italy, Spain, The Netherlands, Switzerland and Austria. The 2010 research programme covers Portugal, Belgium, Denmark, Sweden, UK and one emerging market: Poland.

DATA COLLECTION METHODOLOGY:

- The data is collected by an external market research company through interviews of hospital CIOS (Chief Information Officer) via a mix of online questionnaires and a follow-up telephone interview to ensure completeness and accuracy. The data is collected from acute care hospitals only.
- The questionnaire has been developed by COCIR in partnership with the market research company and is refined on a regular basis to reflect market evolution.
- The definitions for each of the fourty-one information solutions have been developed by COCIR members and are updated on a continuous basis. They are available in the COCIR eHealth Glossary of terms.
- The research sample is randomly drawn from the total universe of acute care hospitals in each country: it includes small, medium, large, public and private hospitals and represents a minimum of 16% of the total number of acute care hospitals in the country.

COCIR GLOSSARY OF TERMS

3

PART 3
COCIR GLOSSARY OF TERMS

3

INTRODUCTION: SEEKING CLARITY ON HEALTHCARE IT

COCIR advocates the deployment of Healthcare IT as being crucial for improving healthcare in Europe.
Before going any further, it is important to define healthcare IT.
eHealth, healthcare IT, health ICTs, health informatics are synonymous. While eHealth is the term most commonly used, COCIR uses preferably 'healthcare IT' and organisations such as the OECD use preferably the term 'health ICTs'. Despite these semantic habits it is worth noting that these terms represent the same concept and refer to the application of information and communication technologies to deliver healthcare.

Healthcare IT is a fast-evolving field, with many new ICT based solutions appearing on the market. It can be difficult to keep track with these developments, understand the purpose of each new solution and to put the right name on the right product. What is an Electronic Patient Record? What is the difference with Electronic Health Record? What is a PACS? What is a Decision Support System? What do we mean by Clinical Information Systems?

The lack of common understanding makes the dialogue between healthcare stakeholders difficult.
COCIR has developed a set of definitions to bring clarity to the field. The COCIR Glossary of Terms provides the following definitions:

- a general definition for eHealth (part 1)
- definitions for terms commonly used in relation to eHealth (part 2)
- technical definitions for systems used in hospitals : clinical information systems (part 3) and hospital information systems (part 4)
- definitions for telemedicine (part 5)

The COCIR glossary of terms aims to be a founding block for a better dialogue and cooperation between stakeholders to improve healthcare delivery in Europe and worldwide. It is a living document which will be enriched on a regular basis.

PART 1: DEFINING HEALTHCARE IT / eHEALTH

eHealth describes the application of information and communications technologies (ICTs) across the whole range of functions that affect the health sector. “eHealth”, “healthcare IT”, “health ICTs” and “health informatics” are synonymous.

eHealth includes tools for health authorities and professionals as well as personalised health systems for patients and citizens. eHealth can therefore be said to cover the interaction between patients and health-service providers, institution-to-institution transmission of data, or peer-to-peer communications between patients and/or health professionals; it can also include health information networks, electronic health records, telemedicine services, and personal wearable and portable communicable systems for assisting prevention, diagnosis, treatment, health monitoring and lifestyle management.

eHealth comprises five types of systems:
- Hospital Information Systems
- Clinical Information Systems
- Telemedicine Solutions and Services
- Secondary-Usage non-Clinical Systems
- Integrated Health Information Networks

PART 2: GENERAL eHEALTH RELATED DEFINITIONS

AMBIENT ASSISTED LIVING
Systems, services and devices providing unobtrusive support for daily life depending on the context and the situation of the assisted persons.

AUTHENTICATION[20]
Authentication, in the context of eHealth information security, refers to the confirmation of the identity of a user requesting access to eHealth services and/or patient data. Its purpose is to verify whether or not the user really is who they claim to be. Authentication is not be confused with Authorisation, which deals with rights particular users or user groups may or may not have.
While Authentication deals with questions like: “Is this person really Dr. X?”, Authorisation might ask “Does Dr. X have the right to access this specific kind of data?”.

CLINICAL PATHWAYS
Clinical pathways, also known as care pathways, critical pathways, integrated care pathways, or care maps, are one of the main tools used to manage the quality in healthcare concerning the standardisation of care processes. It has been proven that their implementation reduces the variability in clinical practice and improves outcomes. Clinical pathways promote organised and efficient patient care based on the evidence-based practice. Clinical pathways optimise outcomes in the acute care and homecare settings.
Generally clinical pathways refer to medical guidelines. However a single pathway may refer to guidelines on several topics in a well specified context.

20 epSOS definition, http://www.epsos.eu/glossary.html?tx_a21glossary%5Buid%5D=1072&tx_a21glossary%5Bback%5D=362&cHash=dbc5cbd23e

CLOUD COMPUTING

Cloud computing is internet-based computing, whereby shared servers provide computing power, storage, development platforms, or software to computers and other devices on demand.
This frequently takes the form of 'Infrastructure as a Service' (IaaS), 'Platform as a Service (PaaS)' or 'Software as a Service' (SaaS). Users can access web-based tools or applications through a web browser as if they were installed locally, eliminating the need to install and run the application on the customer's own computers and simplifying maintenance and support.

eDISPENSATION (ELECTRONIC DISPENSATION)

eDispensation -or eDispensing- is defined as the act of electronically retrieving a prescription and dispensing medicine to the patient as indicated in the corresponding ePrescription. Once the medicine has been dispensed, the dispenser sends an electronic report on the medicine(s) dispensed.

ELECTRONIC HEALTH RECORD (EHR)

An electronic health record (EHR) is a record in digital format containing medical information about a patient. Such records may include a whole range of data in comprehensive or summary form, including demographics, medical history, medication and allergies, immunization status, laboratory test results, radiology images, vital signs, personal statistics like age and weight, and billing information.

There are different types of electronic health records:
Electronic medical record / Electronic patient record
Patient summary
Personal health record

ELECTRONIC MEDICAL RECORD (EMR) / ELECTRONIC PATIENT RECORD (EPR)

Electronic Patient Record (EPR), Electronic Medical Record (EMR), Computerised Patient Record (CPR) are synonymous.
They refer to an individual patient's medical record in digital format generated and maintained in a healthcare institution, such as a hospital or a physician's office.
Such records may include a whole range of data in comprehensive or summary form, including demographics, medical history, medication and allergies, immunization status, laboratory test results, radiology images, and billing information.
The purpose of an EPR/EMR can be understood as a complete record of patient encounters that allows the automation and streamlining of the workflow in health care settings and increases safety through evidence-based decision support, quality management, and outcomes reporting.

COCIR proposes a more detailed and technical definition describing EPR/EMR systems, as used in hospitals, in part 3 of this glossary.

ENTERPRISE IT

Enterprise IT is synonymous with Hospital IT. See Hospital IT definition.

ePRESCRIPTION (ELECTRONIC PRESCRIPTION)

An ePrescription is an electronic prescription: a medicinal prescription, e.g. a set of data like drug ID, drug name, strength, form, dosage and/or indication(s), provided in electronic format.
The term 'ePrescription' may cover different functionalities, and depending on national viewpoints, the definition of ePrescription may vary. In general, the term 'ePrescription' may refer to the following features:

- electronic medication record of an individual
- informed prescription with electronic decision support
- electronic transmission of a prescription.

21 epSOS definition, http://www.epsos.eu/test/work-package-31.html

In this framework, the ePrescription service is understood as the prescription of medicines using software, the electronic transmission of the prescription from the prescriber (the healthcare professional) to a dispenser (e.g. pharmacy), where the prescription is electronically retrieved, the medicine is given to the patient and information about the dispensed medicine(s) is reported electronically[21].

HOSPITAL IT

Hospital IT –also often referred to as Enterprise IT- is a generic term referring to ICT-based products, systems, solutions and services used in hospitals to:

- manage healthcare processes
- manage the hospital administrative and business processes

Hospital IT includes Hospital Information Systems (Patient Administration Systems, Finance and Accounting Systems, Business Process Support, Logistics and Resource Systems) and Clinical Information Systems (Radiology Information Systems, Oncology Information Systems, Computerized Physician Order Entry Systems, Electronic Patient Records, etc.).

INFORMATION SYSTEM[22] (IS)

An Information System (IS) is any combination of information technology and people's activities using that technology to support operations, management, and decision-making. In a very broad sense, the term information system is frequently used to refer to the interaction between people, algorithmic processes, data and technology. In this sense, the term is used to refer not only to the information and communication technology (ICT) an organisation uses, but also to the way in which people interact with this technology in support of business processes.

INFOSTRUCTURE[23]

eHealth Info-structure should be understood as the foundation layer containing all data structures, codifications, terminologies and ontologies, data interoperability and accessibility standards, stored information and data as well as rules and agreements for the collection and management of these data and the tools for their exploitation. At European level, such a European infostructure may be composed of biomedical and health/medical research and knowledge databases, public health data repositories, health education information, electronic patient and personal health records systems, data warehouses, etc.

INTEGRATED HEALTH INFORMATION NETWORKS

Networks supporting the exchange, processing and storage of health information. Integrated means that these networks are part of a broader IT infrastructure connecting different applications, servers or data centers, e.g. in a hospital or in a chain of hospitals, or even in local/regional or national IT infrastructure.

INTEROPERABILITY[24]

Interoperability is a property referring to the ability of diverse systems and organisations to work together (inter-operate) without any restricted access or implementation.

Health system interoperability means the ability, facilitated by ICT applications and systems to exchange, understand and act on citizens/patient and other health related information and knowledge among linguistically and culturally disparate clinicians, patients and other actors and organisations within and across health system jurisdictions in a collaborative manner.

Technical interoperability means the ability of two or more applications, to accept data from each other and perform a given task in an appropriate and satisfactory manner without the need for extra operator intervention.

22 Wikipedia definition

23 European Commission definition
http://ec.europa.eu/information_society/activities/health/glossary_of_terms/

24 epSOS definition, http://www.epsos.eu/glossary.html?tx_a21glossaryadvancedoutput_pi1%5Bchar%5D=all&tx_a21glossaryadvancedoutput_pi1%5Bpointer%5D=3&cHash=7d686bc999

Semantic interoperability means ensuring that the precise meaning of exchanged information is understandable by any other system or application not initially developed for this purpose. It also refers to the ability of two or more systems or components to exchange information and to use the information that has been exchanged.

mHEALTH – MOBILE HEALTH

mHealth (also written as m-health) is the use of mobile communications – such as personal digital assistants and mobile phones – for health services and information. The mHealth field has emerged as a subset of telemedicine. mHealth applications range from SMS medication reminders - based on existing mobile capabilities - to collecting community and clinical health data, delivery of healthcare information to practitioners, researchers, citizens and patients, real-time monitoring of patient vital signs and direct provision of care.

PATIENT SUMMARY[25]

A Patient Summary is a sub-set of an Electronic Medical Record.
A Patient Summary is a concise clinical document which provides an electronic patient health data set applicable both for unexpected, as well as expected, health care contact.
The primary application of an electronic patient summary is to provide the healthcare professional with a dataset of essential and understandable health information needed in case of unexpected or unscheduled care (e.g. an emergency or accident) or in the case of planned care (e.g., the patient is in another area and needs to consult a healthcare professional other than their regular contact person).
The Patient Summary does not include a detailed medical history, details of the clinical condition, or the full set of the prescriptions and medicines dispensed but includes data such as:

- Patient's general information (mandatory)
- Medical summary (mandatory)
- Medication summary (mandatory)

A patient may have more than one electronic patient summary.

PATIENT REGISTRY

Patient registries are collections of secondary data related to patients with a specific diagnosis, condition, or procedure. In its most simple form, a disease registry could consist of a collection of paper cards kept inside a box by an individual doctor. Most frequently, registries vary in sophistication from simple Excel spreadsheets which can only be accessed by a small group of doctors to very complex databases which are accessed online across multiple institutions. They can give healthcare providers (or even patients) with reminders to check certain tests in order to reach certain quality goals.
Patient registries are less complex and simpler to setup than Electronic Medical Records/Electronic Patient Records. An EMR/EPR keeps track of all the patients a doctor follows while a registry only keeps track of a small sub population of patients with a specific condition.

PERSONAL HEALTH RECORD

A personal health record -or PHR- is a health record that is initiated and maintained by an individual.
Other health records such as electronic patient record (EPR) or electronic medical record (EMR) are generated and maintained within an institution, such as a hospital, clinic, or physician office.

25 epSOS definition, http://www.epsos.eu/glossary.html?tx_a21glossary%5Buid%5D=542&tx_a21glossary%5Bback%5D=362&cHash=732dae584e

26 European Commission definition
http://ec.europa.eu/information_society/activities/health/glossary_of_terms/

PERSONAL HEALTH SYSTEMS (PHS)

Personal Health Systems (PHS) assist in the provision of continuous, quality controlled, and personalised health services, including diagnosis, treatment, rehabilitation, disease prevention and lifestyle management, to empowered individuals regardless of location. PHS consist of: intelligent ambient and/or body devices (wearable, portable or implantable); intelligent processing of the acquired information; and active feedback from health professionals or directly from the devices to the individuals.

PERSONALISED MEDICINE

Personalised medicine is a medical model emphasising the customisation of healthcare, with all decisions and practices tailored to individual patients. Recently, this has mainly involved the systematic use of genetic or other information about an individual patient to select or optimise the patient's preventative and therapeutic care.

Traditionally, personalised medicine has been limited to the consideration of a patient's family history, social circumstances, environment and behaviours in tailoring individual care. It is now extended to the individual's genomes to understand the individual's susceptibility to diseases and possible reactions to treatment.

Fields of Translational Research termed «-omics» (genomics, proteomics, and metabolomics) study the contribution of genes, proteins, and metabolic pathways to human physiology and variations of these pathways that can lead to disease susceptibility. It is hoped that these fields will enable new approaches to diagnosis, drug development, and individualized therapy.

SECONDARY USAGE NON-CLINICAL SYSTEMS

Secondary usage non-clinical systems include:

- Systems for health education and health promotion of patients/citizens such as health portals or online health information services.
- Specialised systems for researchers and public health data collection and analysis such as bio-statistical programmes for infectious diseases, drug development, and outcomes analysis.

SOFTWARE AS A SERVICE (SaaS)

Software as a service, sometimes referred to as «software on demand,» is software that is deployed over the internet and/or is deployed to run behind a firewall on a local area network or personal computer. With SaaS, a provider licenses an application to customers either as a service on demand, through a subscription, in a «pay-as-you-go» model, or at no charge. This approach to application delivery is part of the utility computing model where all of the technology is in the «cloud» accessed over the internet as a service.

VIRTUAL PHYSIOLOGICAL HUMAN (VPH)[27]

Virtual Physiological Human (VPH) is a methodological and technological framework, targeting multi-scale models and simulation aiming at personalised, predictive and integrative medicine and information infrastructures. Once established, it will enable collaborative investigation of the human body as a single complex system.

PART 3: HOSPITAL INFORMATION SYSTEMS (HIS)

Hospital Information Systems manage the administrative and financial aspects of a hospital (patient administration, finance, accounting, logistics, human resources, materials management etc). This includes paper-based information processing as well as data processing machines. Hospital information systems include business process support systems, finance and accounting systems, logistics and resource systems, patient administration systems.

3.1. BUSINESS PROCESS SUPPORT

Systems designed to support the business processes of a hospital. They collect, integrate, analyse and present business information to improve business decision-making.

BUSINESS INTELLIGENCE SYSTEMS (BI)

Business Intelligence (BI) systems refer to technologies, applications and practices for the collection, integration, analysis, and presentation of business information to improve business decision-making by using fact-based/data-driven decision support systems. BI systems provide historical, current and predictive views of business operations using data from a (clinical) data warehouse and operational data.
The emerging integrated clinical/financial BI systems approach therefore combines traditional sources (such as human resources, cost accounting and financial reporting) with rich clinical data from computer-based patient record/medical records (EPR/EMR).
However, a BI system is much more than a data warehouse. Its purpose is to provide insights that affect and improve business/clinical processes and all the associated outcomes (clinical, financial, etc.). BI also has a real-time, immediate dimension. Results can be either predictive or correlative in nature.

CLINICAL DATA WAREHOUSING SYSTEMS (CDW)

Data Warehousing Systems (CDW) are integrated systems of patient related clinical data allowing the collection and normalisation of data from disparate clinical sources into a database designed to support management clinical decision-making, performance analysis purposes or research. CDW can be stand-alone solutions based on database platforms and integration standards, or integrated with an Electronic Patient Record/Electronic Medical Record (EPR/EMR) solution or built at regional level as is the case in Norway and Sweden. In all cases, CDW are usually tied to the Master Patient Index (MPI).

QUALITY MANAGEMENT SYSTEMS (QMS)

Also called Assurance Information Systems, QMS support the monitoring of the overall performance and quality of clinical care by analysing, comparing and treating information of detailed clinical practices patterns and parameters. Quality Management / Assurance IS might also include compliance/audit features, for example by asking if the care which was documented matched the care given). It also has a real-time, immediate dimension. Results can be corrective and preventive in nature.

27 European Commission definition
http://ec.europa.eu/information_society/activities/health/glossary_of_terms/

3.2. FINANCE & ACCOUNTING SYSTEMS

Information systems designed for the finance and accounting departments of hospitals to manage financial and accounting processes. They include – amongst others - Coding Information Systems, Financial Accounting and Controlling Information Systems.

CODING INFORMATION SYSTEMS

Coding Information Systems are used to collect and code clinical service information for patient billing, insurance claims, activity analysis and cost accounting. They may include DRG-Management features. They enable the personnel to find and use complete and accurate codes and code modifiers for procedures and diagnostics to optimize billing and reimbursement. They are rarely a stand-alone system and can be part of Patient Administration System either directly or through the Electronic Patient Record / Electronic Medical Record (EPR/EMR) depending on each country's coding workflow specificities (in Germany, for example, coding is performed by physicians). Coding Information Systems are usually associated with care administration but have also clinical relevance with specific code for clinical purposes or research.

FINANCIAL ACCOUNTING & CONTROLLING INFORMATION SYSTEMS

Financial Accounting & Controlling Information Systems record and process accounting transactions within a variety of functional modules, including Accounts receivable (AR), Accounts payable (AP), General ledger (GL), Billing, Stock/Inventory, Purchase Requisition and Purchase Order (PO), Debt Collection (DC), Expenses, Inquiries, Payroll, Timesheets, and Controlling and Financial Reporting. Coding Information Systems might be part of this or provided as a separate Information System. Financial Accounting & Controlling Information Systems can be stand-alone systems or part of an Enterprise Resource Planning (ERP).

3.3. LOGISTICS AND RESOURCE SYSTEMS

Logistics and resource systems are information systems designed to manage the logistics and resources of a hospital. They include – amongst others – enterprise resource planning systems, Human Resources management systems, supply chain management systems, etc.

ENTERPRISE RESOURCE PLANNING SYSTEMS (ERP)

Enterprise Resource Planning Systems are business management systems that integrate multiple business applications including human resources and payroll management, materials management, supply chain management, financials and accounting management as well as customer relationship management (CRM) by providing an automated and integrated view of business information and reports of data from several operational areas.

FACILITY & EQUIPMENT MANAGEMENT SYSTEMS

Facility & Equipment Management systems control and monitor facilities and equipments, describe and track their deployment, maintain the clinical infrastructure and optimize resource utilization. Additionally, they can manage the interactions and activities from the selection and acquisition, inspections/maintenance through to the eventual retirement/disposal of medical equipment governed by related policies and procedures. Available as stand-alone tools/systems (e.g. Medical Equipment Management System - MEMS; Facility Management System - FMS) or as part of an Enterprise Resource Planning (ERP) system or a Hospital Information System. Such systems require integration with key clinical systems (orders etc).

HUMAN RESOURCES MANAGEMENT SYSTEMS (HRM)

Human Resource Management Systems manage the administration of personnel, including personnel planning/staff/nurse scheduling, employee time and attendance tracking/labour time assessment, payroll and controlling. Individual functions may be stand-alone solutions or part of an Enterprise Resource Planning (ERP) system including Payroll and Human Resources. In healthcare delivery systems operated by government (e.g. national health systems), HRM systems may reside on government systems.

SUPPLY CHAIN MANAGEMENT (SCM)/MATERIALS MANAGEMENT SYSTEMS

Supply Chain Management Systems manage the processes of planning, implementing and controlling all movement and storage of materials and inventory from point-of-origin to point-of-consumption. Key functionalities include: purchase order processing, inventory management, warehouse / materials management, supplier relationship management/sourcing. SCM are available as stand-alone tools/systems or as part of an Enterprise Resource Planning (ERP) system. Stand alone systems/tools may also be integrated with Enterprise Resource Planning (ERP) solutions. SCM require the integration with key clinical systems (orders, etc.).

3.4. PATIENT ADMINISTRATION SYSTEMS

A patient administration system is one of the earliest components of a hospital computer system which manages the administrative side of the relations with a patient.

Patient administration systems include - among other things - admission, discharge and transfer systems, master patient index systems, patient relationship management systems, scheduling of critical resources or facilities systems.

ADMISSION, DISCHARGE & TRANSFER SYSTEMS (ADT)

Also called registration systems, ADT systems include pre-registration, patient history (administrative), patient admission and discharge transfer functions. They are rarely stand-alone systems and are mainly part of an overarching Patient Administration System (PAS).

MASTER PATIENT INDEX SYSTEMS (MPI OR EMPI)

MPI systems maintain a unique patient identifier and a single master index of all patients, which references all patient indices within a single facility (e.g. hospital or a group of hospitals) to correctly identify and share patient information across linked IT systems with multiple authorised users. MPI systems also provide additional search functionality for specific patients including full name, partial names, address, ID numbers, etc. MPI systems are rarely a stand-alone system and are very often an integral component of a Patient Administration System (PAS) or electronic patient records (EPR)/electronic medical records (EMR). MPI is for a single facility whereas EMPI is a unique patient identifier for multi-facilities (who may each identify patients non-uniquely across facilities). To accurately match and link records across systems, a stand-alone EMPI has proven integration with these systems, scalability to support real-time identification across millions of records and most importantly a matching algorithm that can take data from different systems and create a unified view.

PATIENT RELATIONSHIP MANAGEMENT SYSTEMS (PRM)

PRM refers to the use of IT for identifying and anticipating patient needs and preferences by providing a centralised view on patient demographic information in order to tailor communications and programmes accordingly. PRM introduces the principles of customer relationship management (CRM) into healthcare. It can be a stand-alone system (e.g. standard CRM solutions), part of a Patient Administration System (PAS) or an ERP system (Enterprise Resource Planning), but it can also be a mix of stand-alone solutions for individual aspects (e.g. patient questionnaires, direct marketing activities such as mailings, etc.).

SCHEDULING OF CRITICAL RESOURCES OR FACILITIES SYSTEMS

Patient scheduling systems coordinate scheduling of all care providers resources for a specific patient (inpatient or outpatient) and identify conflicts with other appointments for the patients or provider resources. It may include staff, critical resources (beds, surgery rooms, etc.), materials (diagnostic equipments) as well as preparation requirements (anesthesia consultation). It is rarely a stand-alone system and is mainly part of a Patient Administration System (PAS). It may also be part of an Enterprise Resource Planning (ERP) system including features which support clinical and enterprise scheduling. Patient scheduling systems are general and therefore differ from specialised scheduling systems such as Emergency/Operating Room/ICU scheduling systems. They also differ from resource planning or departmental scheduling.

PART 4: CLINICAL INFORMATION SYSTEMS (CIS)

Clinical Information Systems refer to comprehensive, integrated information systems designed to manage the clinical functions of a hospital.

Clinical Information Systems aim to increase the efficiency of healthcare delivery by archiving patient data, providing faster access to patient data between healthcare professionals/hospital departments and guiding healthcare professionals when making medical decisions.

Clinical Information Systems can be composed of one or more software components with core functions such as electronic patient record information systems, medical document management information systems, computerised physician order entry as well as a large variety of sub-systems in medical specialties (e.g. oncology information systems, orthopedic information systems, etc.) and service departments (e.g. Laboratory Information System, Radiology Information System).

Clinical Information Systems include clinical knowledge and decision support systems, clinical order communication management systems, medical record systems, medico-technical service department systems.

4.1. CLINICAL KNOWLEDGE, DECISION & PROCESS SUPPORT INFORMATION SYSTEMS

Systems designed to assist health professionals with decision- making by linking dynamic individual patient health observations with a common clinical knowledge management system. They include among others clinical decision support systems, clinical workflow management systems, etc.

CLINICAL KNOWLEDGE MANAGEMENT & CLINICAL DECISION SUPPORT SYSTEMS (CDSS)

Systems designed to assist health professionals with decision- making by linking dynamic individual patient health observations with a common clinical knowledge management system. They include among others clinical decision support systems, clinical workflow management systems, etc.

CLINICAL KNOWLEDGE MANAGEMENT & CLINICAL DECISION SUPPORT SYSTEMS (CDSS)

Clinical Decision Support Systems are an interactive computer program designed to assist doctors and other healthcare professionals with decision-making tasks by linking dynamic individual patient health observations (e.g. monitored in an Electronic

Patient Record) with a common clinical knowledge management system (e.g. a set of rules derived from experts and evidence-based medicine). Decision support systems are based on knowledge management systems also named Rules Engines. Rules Engines maintain complex rule sets designed by end users and acquired from extra knowledge sources. Rules Engines are critical to extending Electronic Patient Record systems beyond the capabilities of human cognition and enhancing collaboration. Because medical knowledge has moved beyond the ability of unassisted human to track all relevant information, the use of clinical decision support implemented in a rule engine is now necessary to practice state-of-the art medicine.

CLINICAL WORKFLOW MANAGEMENT INFORMATION SYSTEMS (CWMS)

Clinical Workflow Management Information Systems optimally co-ordinate the multidisciplinary clinical processes from admission to discharge for each patient based on a single individual care plan by linking a complete view of the patient's movement through the hospital to clinical decision support. It involves the use of workflow engines which support explicit clinical and operational workflows created by users and supported by scientific literature using graphical design tools. It supports the practice of evidence-based medicine and provides the infrastructure necessary for an organisation to optimise its clinical activities.
These systems can be stand-alone solutions from basic Therapy Planning software to departmental solutions integrated with the different clinical information solutions or ultimately integrated solution with Knowledge Management Systems and Decision Support Systems in an Hospital Information Systems/Clinical Information Systems (HIS/CIS).

DISEASE MANAGEMENT INFORMATION SYSTEM

Disease Management Information System support healthcare professionals to manage patients who have one or more chronic conditions. Such systems, unlike Electronic Patient Records, do not document the entire patient's encounter, but rather focus on chronic disease and preventive care. The use and concept behind Disease Management Information Systems are not widespread, hence relatively new with unclear boundaries. They might often be confused with «disease-specific registry».

eLEARNING APPLICATIONS AND ONLINE TRAINING OF STAFF

eLearning enables the distribution and presentation of teaching materials for professional education and training. eLearning can be based on a range of technologies and media (generally all digital media, here defined as computer and web based) and covers a broad range of forms and applications.

4.2. CLINICAL ORDER COMMUNICATION MANAGEMENT INFORMATION SYSTEMS

Systems designed to place and share clinical orders between healthcare professionals and hospital departments.

CLINICAL ORDER ENTRY & RESULT REPORTING/COMPUTERISED PHYSICIAN ORDER ENTRY (CPOE)

Clinical Order Entry/Results Reporting information systems allow for the placement of clinical service orders for patient services or medications, including medications, procedures, examinations, nursing care, diets, laboratory tests, etc. - with subsequent automated distribution of the clinical documentation processed as a result of this order. Order entry & result reporting can be a stand-alone solution or part of RIS, LIS or HIS.
CPOE systems have the same functionality as a Clinical Order Entry/results reporting IS but in addition include special electronic signature, workflow, and rules engine functions.

ELECTRONIC TRANSMISSION OF PRESCRIPTIONS INFORMATION SYSTEM (ETP)

Electronic Transcription of Prescriptions Information System (ETP IS) facilitates the end-to-end medication management including ordering, dispensing and administration. They are point to point systems and do not include decision support functionalities. ETP IS can be a stand-alone solution or a module of Pharmacy information system.

ePRESCRIBING SYSTEM

ePrescribing Systems facilitate the end-to-end medication management including ordering, dispensing, and administration. Compared to the ETP, it goes further and updates the Medication Administration Record. It addresses large scale benefits of decision support allowing physicians to review patient history and recommended dosage. Very often, it works in conjunction with other technologies, such as mobile devices, bar coding and automated dispensing machines. ePrescribing can be stand-alone solutions or modules of Pharmacy Information Systems.

4.3. MEDICAL RECORDS / ELECTRONIC PATIENT RECORD INFORMATION SYSTEMS

Systems that record and/or host information about the patient on an electronic file. They include digital dictation and transcription information systems, electronic patient records and medical document management systems.

DIGITAL DICTATION & TRANSCRIPTION INFORMATION SYSTEM

A Digital Dictation Information System facilitates the management of voice-recorded notes and reports. It converts voice-recorded notes and reports as dictated by physicians and/or other healthcare professionals into computerized text format (i.e. Medical Transcription). It can be stand-alone digital sound recording software and speech recognition software or integrated digital dictation & transcription workflow software.

ELECTRONIC PATIENT RECORD (EPR)/ELECTRONIC MEDICAL RECORD (EMR)

Electronic Patient Record (EPR), Electronic Medical Record (EMR), Computerised Patient Record (CPR) are synonymous.
They refer to an individual patient's medical record in digital format generated and maintained in a healthcare institution, such as a hospital or a physician's office (as opposed to a personal health record -PHR- that is generated and maintained by an individual) Such records may include a whole range of data in comprehensive or summary form, including demographics, medical history, medication and allergies, immunization status, laboratory test results, radiology images, and billing information.
The purpose of an EPR/EMR can be understood as a complete record of patient encounters that allows the automation and streamlining of the workflow in health care settings and increases safety through evidence-based decision support, quality management, and outcomes reporting.
EPR/EMR are made up of electronic medical records from many locations and/or sources and a variety of healthcare-related information to enable complete patient-centered documentation from initial diagnosis and therapy through to continuity-of-care planning. A graphical user interface on the clinical workstations allows authorized healthcare providers to retrieve/access, review and update a single patient's record at any linked department or facility. Medical technical devices may feed data automatically into the patient record. EPR/EMR are included in an application environment which is composed of the clinical data repository, clinical decision support, controlled medical vocabulary, order entry and results reporting/CPOE, and clinical documentation applications.

MEDICAL DOCUMENT MANAGEMENT INFORMATION SYSTEM (MDM)

Medical Document Management systems mean a central repository system for disparate electronic/digital medical patient documents/files (e.g. care episodes, test results, diagnoses, referrals, discharge letters, etc.). Documents may have been digitized (e.g. scanned) or created in digital format (e.g. by information systems). Key functions of medical document management systems include computer-aided document/file entry, indexing, administration, storage and access/retrieval of individual documents/files. Some systems include image archiving functions. Medical document Management systems might be integrated in a Hospital information system/Clinical information system (HIS/CIS).

4.4. MEDICO-TECHNICAL SERVICE DEPARTMENT SYSTEMS

Specialised systems designed to support clinical processes in the various service departments of a hospital. They include - amongst others - laboratory information systems, radiology information systems and picture archiving communications systems.

ADVANCED VISUALISATION INFORMATION SYSTEM

Advanced Visualisation Information Systems (IS) or advanced image processing tools, e.g. 3D MPR/MPI, CT/MR matching, Computer Aided Decision (CAD) support the decision making processes and visualisation of the areas of interest for the physicians in radiology, cardiology, oncology, neurology, pathology, orthopedics, etc. Advanced Visualization Information Systems may imply a variety of techniques and methods such as extracting more information from existing datasets, providing a richer display of anatomic information than conventional section, volumetric interpretation of image data, Computer Aided Decision (CAD) and other advanced imaging techniques.

CARDIOLOGY PACS

Cardiology Picture Archiving and Communications Systems (PACS) are defined as a coherent system including a networked digital archive with online and nearline storage components, dedicated reading workstations, and all the associated software required to store, manage and view cardiology images. As for radiology, Cardiology PACS and Cardiovascular Information Systems (CVIS), the two systems are continuously becoming more integrated.

CARDIOVASCULAR INFORMATION SYSTEM (CVIS)

Cardiovascular Information Systems (CVIS) automate processes within the cardiology department, supporting scheduling, ordering, documentation and data capture. CVIS can be stand-alone solutions or integrated with a Cardiology Picture Archiving and Communications Systems (PACS) or as a module of a HIS/CIS (Hospital Information System/Clinical Information System).

EMERGENCY INFORMATION SYSTEM

Emergency Information Systems support emergency department clinicians, nurses and staff in the critical task of managing patients quickly and efficiently. They provide features for care management and instant access to up-to-date patient information. They ensure a smooth transition for patients including triage and tracking as they are admitted to hospitals or discharged. Emergency IS can be stand-alone solutions or modules of a Hospital Information System/Clinical Information System (HIS/CIS).

IMAGING DATA CENTERS (IDC)

Imaging Data Centers (IDC) provide a central imaging data repository (in-house or off-site) for a multi-site environment (e.g. a hospital chain), region or country. Very often based on a hub and spoke model, IDC provide a redundant central data repository to store and archive radiology and non-radiology diagnostic images often including relevant key image notes/post processing measurements combined with relevant reports. Outside the sharing of information based on secure access and authorisation, IDC offer resilience against network interruptions, centralised long-term archive and disaster recovery services.

INTENSIVE CARE UNIT INFORMATION SYSTEM (ICU IS)

Intensive Care Unit Information Systems provide automated functions for the automated documentation and protocol intervention management by the intensive care unit. Intensive care unit information systems also capture the data output from all medical devices monitoring the patient's clinical status. They include order entry, clinical documentation and flow charts, decision support and results reporting. They often summarise large amounts of observations to feed into the electronic medical records. ICU IS can be stand-alone solutions or modules of a Hospital Information System/Clinical Information System (HIS/CIS).

INTERNAL MEDICINE INFORMATION SYSTEM

Internal Medicine Information Systems provide automated functions in the internal medicine department. Internal medicine Information Systems can be stand-alone solutions or modules of a Hospital Information System/Clinical Information System (HIS/CIS).

LABORATORY INFORMATION SYSTEM (LIS OR LIMS)

Laboratory Information Systems (LIS) provide complete support for the laboratory department from an operational, clinical and management perspective. LIS can cover a number of different laboratory or pathology systems including different specialties such as Hematology, Histopathology, Microbiology, etc. The system provides an automatic interface to laboratory analytical instruments to transfer verified results to nurses' stations and even to remote doctors' offices. The system allows the user to receive orders from any designated location, process the order and report results, and maintain technical, statistical and account information. Laboratory Information Systems are available as stand-alone solutions or as module(s) of Hospital Information Systems/Clinical Information Systems (HIS/CIS).

NURSING INFORMATION SYSTEM

Nursing Information Systems document nursing notes which describe the nursing care or services provided to a patient. It provides observations, decisions, actions and the outcomes of these actions. Nursing Information Systems track what occurred and when it occurred. They can be stand-alone solutions or modules of a Hospital Information System/Clinical Information System (HIS/CIS).

ONCOLOGY INFORMATION SYSTEM

Oncology Information Systems comprise a set of systems which manage advanced clinical, administrative and financial processes in a completely integrative environment. Oncology Information Systems automate the clinical decision-making and complex communications needs of the medical oncology care team. It provides the ability to share information across venues for complex, multi-encounter chemotherapy protocol management. Oncology Information Systems can be a stand-alone solutions or modules of a Hospital Information System/Clinical Information System (HIS/CIS).

OPERATING THEATRE IS (OT IS)

Operating Theatre Information Systems provide automated functions in the operating theater department. OT IS can include peri-operative, post-operative and pre-operative functionalities. They might also include OT scheduling functionalities. OT IS can be stand-alone solutions or modules of a Hospital Information System/Clinical Information System (HIS/CIS).

ORTHOPAEDICS INFORMATION SYSTEM

Orthopaedics Information Systems provide automated functions in the Orthopaedics department. When associated with a PACS, they include image acquisition, storage, distribution and viewing to preoperative planning using digital implant templates. Orthopaedics Information Systems can be stand-alone solutions or modules of Hospital Information System/Clinical Information System (HIS/CIS).

PHARMACY INFORMATION SYSTEM (PHIS)

Pharmacy Information Systems provide complete support for the pharmacy department from an operational, clinical and management perspective. It also allows the pharmacist to enter and fill physician orders, and as a by-product, performs all the related functions of patient charging, distribution of drugs and re-supply scheduling, pharmacy stock control, tracking of usage at ward level and post-hoc checking of prescriptions. PHIS may be associated with CPOE for prescriptions (CPOE or ePrescribing). PHIS can be stand-alone solutions or modules of Hospital Information Systems/Clinical Information Systems (HIS/CIS). Patient safety imperatives are driving a trend to tighter and tighter integration within HIS/CIS.

RADIOLOGY INFORMATION SYSTEM (RIS)

Radiology Information Systems are used by radiology departments to store, manipulate and distribute patient radiological data and imagery. The system generally consists of patient administration, scheduling, examination, reporting, accounting, statistics and system administration. The RIS can be stand-alone or integrated in a Picture Archiving and Communication System (PACS) or the Hospital Information System (HIS).

RADIOLOGY PACS

Radiology Picture Archiving and Communications Systems (PACS) address providers' storage, retrieval, distribution and presentation requirements for radiography imaging. While older PACS implementations do not include Radiology Information Systems (RIS) the two systems are becoming ever more integrated, moving away from standalone systems and towards combined PACS and RIS. While Radiology PACS has traditionally been located within the radiology department, the importance of these systems to other clinical areas, including cardiology and pathology, continues to grow. PACS can be available as stand-alone solutions (modality PACS - basic solution integrated with the imaging device; mini-PACS - scaled-down/entry-level departmental solution); hospital-wide general or specialty, (e.g. Radiology PACS) or integrated RIS/PACS.

TELERADIOLOGY INFORMATION SYSTEM

Teleradiology Information Systems enable the secure remote evaluation of digital diagnostic studies (CT scans, MRIs and X-Rays). This technology enables both remote staff radiologists and third-party providers to complete primary and non- primary diagnostic studies from any location. It includes hospital-to-home teleradiology for out-of-hours health care coverage e.g. remote working for radiologists who are part of the hospital radiology department. It also covers outsourcing to other imaging centres or commercial teleradiology companies that provide outsourcing services for image interpretation (night and/or day reads).

PART 5: TELEMEDICINE

Telemedicine is the overarching definition covering Telehealth, Telecare, mHealth and Teledisciplines.

Telemedicine can be defined as the delivery of healthcare services through the use of Information and Communications Technologies (ICT) in a situation where the actors are not at the same location. The actors can either be two healthcare professionals (e.g. teleradiology, telesurgery) or a health care professional and a patient (e.g. telemonitoring of the chronically ill such as those with diabetes and heart conditions, telepsychiatry etc). Telemedicine includes all areas where medical or social data is being sent/exchanged between at least two remote locations, including both caregiver to patient/citizen as well as doctor to doctor communication.

5.1. GENERAL TELEMEDICINE RELATED DEFINITIONS

mHEALTH

See mHealth definition in part 1.

PERSONAL HEALTH SYSTEMS (PHS)[28]

Personal Health Systems (PHS) assist in the provision of continuous, quality controlled, and personalised health services, including diagnosis, treatment, rehabilitation, disease prevention and lifestyle management, to empowered individuals regardless of location. PHS consist of: intelligent ambient and/or body devices (wearable, portable or implantable); intelligent processing of the acquired information; and active feedback from health professionals or directly from the devices to the individuals.

TELE-ASSISTANCE

Tele-assistance can be a medical act when a doctor remotely assists another doctor carrying out a medical or surgical act. The doctor can also assist another healthcare professional providing care or imaging services, even within the framework of an emergency, to remotely assist a first-aid worker or any person providing medical assistance to someone in danger while waiting for the arrival of trained medical professionals.

TELECARE

Telecare designs systems and services capable of social alert and social services. Telecare is used mainly to monitor the situation of people dependent on external help, e.g. elderly or disabled people in the home setting.

TELECONSULTATION

Teleconsultation is a medical act which is carried out in the presence of the patient who dialogues with the physician and/or the physicians consulting at distance as necessary.

TELE-EXPERTISE

Tele-expertise is a remote medical act between at least two healthcare professionals without the presence of the patient for decision purpose.

28 European Commission definition
http://ec.europa.eu/information_society/activities/health/glossary_of_terms/

TELEHEALTH (Includes REMOTE PATIENT MANAGEMENT or "RPMT")

The term telehealth covers systems and services linking patients with care providers to assist in diagnosing and monitoring, as well as the management and empowerment of patients with long-term conditions (chronic patients).

Telehealth solutions use devices (interactive audio, visual and data communication) to remotely collect and send data to a monitoring station for interpretation and to support therapy management programmes and improve patients' knowledge and behaviour.

Telehealth solutions comprise systems and components (patient interfaces in hardware and software; sensors/peripherals; operating software and applications intended for care provider usage; clinical content and intelligence; data transmission, storage and intelligent routing) as well as supporting services (system operation; logistics; financial services; etc).
Input data sources are typically patients' self-assessments ("subjective data") as well as dedicated peripherals to measure vital parameters ("objective data").
Telehealth solutions address healthcare delivery, diagnosis, consultation and treatment as well as education/behavioural modifications and transfer of medical data.

TELE-INTERVENTION

Tele-intervention is a therapeutic medical act which is performed remotely by a physician on a patient, without or with the local presence of other healthcare professional(s) (e.g. telesurgery).

TELEMONITORING

Telemonitoring designs systems and services using devices to remotely collect/send vital signs to a monitoring station for interpretation.

Telemonitoring is the remote exchange of physiological data between a patient at home and medical staff at a hospital to assist in diagnosis and monitoring. This could include support for people with lung function problems, diabetes etc. It includes amongst other things a home unit to measure and monitor temperature, blood pressure and other vital signs for clinical review at a remote location (for example, a hospital site) using phone lines or wireless technology.

5.2. TELEDISCIPLINES

The term «telediscipline» is being introduced as an umbrella to describe various approaches to provide medical services over a distance with the help of ICT. It covers various medical disciplines performed at a distance between two healthcare professionals using ICT. A «telediscipline» typically is restricted to a specific medical discipline. In contrast to a «telediscipline» the terms «telemedicine» or «telehealth» have a more general meaning.

TELECARDIOLOGY

Telecardiology covers the remote collection of cardiology data, mostly ECG data, and its transmission to a service centre. In the centre, the data is evaluated by qualified staff who give advice to a patient or another healthcare provider. In emergencies, the service centre may also trigger rescue measures. Data transmission can either take place continuously or at clearly defined points in time. Data collection can take place either at the patient's home or in a mobile way.

TELEDERMATOLOGY

Teledermatology describes the transmission of visible light images (photos or videos) of disorders of the human skin for classification and diagnosis. It can take the form of primary as well as secondary diagnosis. Detection and classification of skin cancers is a typical example. Since dermatology is a highly specialised discipline and many patients will first see a general practitioner, the use of teledermatology offers great potential to shorten the diagnostic process and speed up the start of appropriate treatment.

TELEOPHTHALMOLOGY

Teleophthalmology describes the remote diagnosis of medical conditions of the human eye. Similar to teledermatology, patients may not have immediate access to an opthalmologist. Ophthalmology not only diagnoses typical diseases of the eye but can also generate useful information on other diseases, e.g. diabetes and cardiac conditions and related secondary symptoms. Data typically takes the form of photos or videos.

TELEPATHOLOGY

Telepathology enables remote staff pathologists, and third-party providers, to securely share images of anatomical pathology specimens to complete primary and non-primary diagnostic evaluation, and to also seek expert second opinions, and primary interpretation of urgent cases, from operating rooms.

TELEPSYCHIATRY

Telepsychiatry is a form of teleconsultation by a psychiatrist of a patient suffering from mental disorder.

TELERADIOLOGY

Teleradiology Information Systems (IS) enables secure remote evaluation of digital diagnostic studies (CT scans, MRIs and X-Rays). This technology enables both remote staff radiologists and third-party providers to complete primary and non- primary diagnostic studies from any location. It encompasses hospital-to-home teleradiology for off-hours health care coverage i.e. remote working for radiologists being part of the hospital radiology department. It also covers outsourcing to other imaging centers or commercial teleradiology companies that provide outsourcing services for image interpretation (night and/or day reads).

TELESCREENING

Telescreening describes the use of a first or second opinion through a remote connection in screening programmes. Either medical data is transferred to a remote specialist for primary evaluation, e.g. in the case that a specific medical qualification is required. Another scenario involves a second opinion in order to increase the quality of the screening process. An example in the form of teleradiology would be the use of screening centres in mammography screening. The data transmitted during telescreening can take any form from digital X-Ray images to video files or ECG or laboratory data.

TELESURGERY

Telesurgery describes the remote controlling of surgical apparatus, e.g. a surgical robot, by an experienced surgeon or the remote advice provided by an experienced surgeon to the surgeon on duty in the operating theatre. In the latter case, a live video connection and an audio connection between the two surgeons is sufficient. In the former case, a data link between the surgical apparatus on site and the remote manipulation tool is required.

GENERAL INFORMATION ABOUT COCIR

Founded as a non-profit trade association in 1959, COCIR represents the radiological, electromedical and healthcare IT industry in Europe. As such, our members play a driving role in developing the future of healthcare both in Europe and worldwide.

COCIR is committed to supporting its members and communicating with its partners in Europe and beyond on issues which affect the medical technology sector and the health of EU citizens.

COCIR also works with various organisations promoting harmonised international standards and fair regulatory control that respects the quality and effectiveness of medical devices and healthcare IT systems without compromising the safety of patients and users.

We encourage the use of advanced technology to support healthcare delivery worldwide.
COCIR's key objectives include promoting free worldwide trade of medical devices and maintaining the competitiveness of the European health sector.

COCIR COMPANY MEMBERS:

AGFA HealthCare · Alcon · alert · ALOKA Science & Humanity · belgacom · BOSCH · Canon · Carestream HEALTH · ELEKTA · FUJIFILM · GE · HITACHI Inspire the Next · HOLOGIC The Women's Health Company · iba · IBM · intel · iSOFT An IBA Health Group Company · KONICA MINOLTA · see it all MEDISON · Microsoft · ORACLE · orange · PHILIPS · saludnova · SHIMADZU Solutions for Science · SIEMENS · T · TOSHIBA Leading Innovation

NATIONAL TRADE ASSOCIATIONS MEMBERS:

AGORIA no future without technology — BELGIUM
FiHTA — FINLAND
snitem creating the tools for medical progress — FRANCE
SPECTARIS German Industry Association for Optical, Medical and Mechatronical Technologies — GERMANY
ZVEI — GERMANY
amdm HUNGARY — HUNGARY
ASSOBIOMEDICA — ITALY
FHI MEDICAL TECHNOLOGY — THE NETHERLANDS
Holland HealthTech — THE NETHERLANDS
TECNOLOGÍA SANITARIA — SPAIN
Medtech — SWEDEN
TIP GÖR DER — TURKEY
AXrEM — UNITED KINGDOM

COCIR HOW TO JOIN US
COCIR aisbl :: Diamant Building :: Boulevard A. Reyerslaan 80 :: 1030 Brussels :: Belgium
Tel +32 (0)2 706 8960 :: Fax +32 (0)2 706 8969 :: Email info@cocir.org :: www.cocir.org