

# **e-Med : the paradigm of the utilisation of digital economy techniques for the reimbursement of medical services across Europe**

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## **Objectives**

Probably no area of human activity stands to gain from electronic commerce as much as healthcare does. Today, all over the world, hospitals and other organisations lose money and resources - and patients sometimes lose their lives - because of inefficiencies in business communications between different parts of the healthcare community. This is exactly where electronic commerce can help. While some pioneering organisations are showing the way, much remains to be done. Health and medical care requires team work between family doctors (GPs), acute hospitals, ambulance services, insurance companies, pharmacies, blood-banks and government departments, to name only a few. Handling a smooth and secure flow of information between these different players is a complex business. At the moment, most of these messages, which include requests for appointments, orders for drugs, blood and other supplies, and invoices for services, are handled on paper. This is slow, inefficient and ties up staff, who could be better employed looking after patients. When inefficiencies lead to errors, in blood orders for example, patients suffer directly. Electronic commerce means handling these billions of routine (and not so routine) transactions online, but for this to happen, clinicians and managers must have absolute faith in their information technology. Until very recently, this was hard to find. In most of Europe, each individual organisation ran its own separate information systems. Even within an organisation, different professional groups, such as doctors, nurses and managers, relied on their own stand-alone systems. So did departments such as pharmacy and radiology. When information needed to be taken from one system to another, for example from patient-administration to pharmacy, it was often printed out and then re-keyed. This legacy of scattered information has many consequences. In most countries, hospital records have improved little since the mid-nineteenth century. Other priorities include: electronic ordering of tests and appointments, electronic prescribing and communications with suppliers, and electronic invoicing between healthcare organisations and those that pay the bill, whether government or private.

At first sight, putting these ideas into practice seems to involve vast amounts of spending on networks, computer hardware and new devices such as smart cards. Today, however, this may not be the case. Much of the technology is already installed or available 'off the

shelf- there is usually no need to re-invent the wheel. For example, thanks to modern security technology, the Internet is a secure medium for electronic commerce.

Computerised prescribing also opens the way for organisations with limited budgets to ensure that doctors prescribe only from an approved list of drugs.

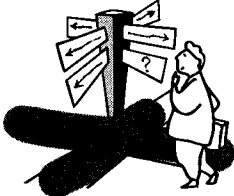

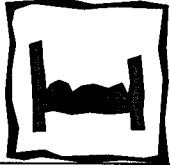




Around the world, many doctors are now prescribing drugs through hospital computer terminals. But there are still obstacles: data content and interface standards are still maturing. There are also cultural issues: even where electronic prescribing is possible, many doctors prefer to make out a hand-written prescription and pass it to a nurse or clerk to enter into the system. A new generation of computer-literate doctors is gradually overcoming this obstacle. They may also be helped by the latest lightweight portable terminals, which allow doctors to write prescriptions at the patient's bedside, or even in their homes, and transmit them directly to pharmacies.

Above all, healthcare worldwide is on the threshold of an information revolution, which will change the practice of healthcare, for example through telemedicine and telecare. And at the same time this revolution will also expose the current inefficiencies in working, and make them unacceptable.

e-Med makes use of technological advances in e-Commerce, medical informatics and modern communications capabilities in order to demonstrate and to deploy an advanced system that can serve all the citizens. A web-based system also is deployed, which allows secure access through Internet connections, is able to manipulate multimedia data and offers the maximum flexibility, independence from location and interoperability. It is designed with the prospect of using third generation communication services. In this way, flexible and seamless from the user point of view communication links will be achieved. e-Med is linking points of care, financing institutions, insurance funds and to develop supporting services. It aims to minimize the transactions between the citizens / patients and the healthcare organisations.

### **How e-Med works**

The table below summarises the key participant in e-Med service.

	Citizens	Includes all the citizens that need health care services
	Physicians	Physicians or doctors that are specialized in health care
	Healthcare organisations	Any kind of (public or private) hospital center that is involved in the provision of primary or secondary care
	Diagnostic centers & Labs	Any kind of diagnostic center (public or private) that will be linked in the healthcare network and will communicate telematically with the physicians, the healthcare organisations and the insurance funds
	Banks	They are interested in supporting such activities in order to increase the added value services to their customers
	Insurance companies	Companies that offer several insurance programs related to the reimbursement of healthcare services
	Pharmacists associations	Association of pharmacists that are interested in selling their products through e-commerce

**The system supports a basic scenario of operation involving all of the above participants as described below:**

1. A citizen visits a healthcare organisation or an individual expert physician or his/her GP to acquire some type of a healthcare service. She/he is a e-Med card-holder, that he/she brings with her/him and presents to the administration entry point. The card represents the key to the administration and medical data of the card-holder.
2. The healthcare service usually triggers additional actions, as for example a pharmaceutical prescription or a lab test. The physician responsible prescribes the additional service using the IT platform of his/her organisation. This platform may be

- independent of the e-Med system ( even pre-existing) or it may be fully developed along the e-Med philosophy. In either case, the actions suggested by the physician are recorded in the healthcare information system and their result (e.g. drugs or lab test prescribed) is temporarily written on the smart card of the patient. In addition, in the case that the system is fully compatible with the e-Med infrastructure, it will be in the position to automatically inform the information system of the patient's insurance company on the prescribed actions.
3. The patient will normally follow the directions of the physician and visit the secondary action fulfilment organisation, i.e. the pharmacy in the case of a drug prescription or the diagnostic center in the case of an MRI test and accordingly for the whole variety of possible additional actions. To simplify the presentation let us take the example of the pharmacy being the second stage. The scenario holds exactly the same for any other type of organisation (hospital, diagnostic center, laboratory). The pharmacist will use the card of the patient to a) identify the patient and his/her insurance organisation and b) decode the physician's prescription. In the case that the pharmacist supports fully the e-Med infrastructure he/she will be in the position to automatically inform the information system of the patient's insurance company on the fulfilment of the prescribed actions. If not this will be done as is traditionally done today.
  4. Additionally, in the first case (i.e. of the total compatibility with the e-Med infrastructure) the pharmacist will automatically recover the amount due to be paid to her/him by the patient's insurance company through the bank(s) participating in the e-Med service.
  5. Furthermore, the e-Med system is designed to get adapted to emerging standards in multi-application smart cards (such as following up of the work in the CEN/ISSS DISTINCT ID workshop on citizen cards) including e-purse smart cards. Thus, it will be possible for the patient to pay her/his potential financial obligation to the pharmacist without the necessity of carrying cash.
  6. The e-Med system is designed in a way as to support fully integrated e-commerce solutions for future expansion. One such solution for example is based on the business-to-consumer concept, in which the patient ("client") she/he will be able to order the prescribed medication from a distance.

## **Results**

e-Med expands the healthcare organisations' functionality by taking up the initiative to provide consultation on electronic business issues, a contribution to the promotion of Electronic Commerce and a step towards e-Europe. Specifically e-Med contributes to eEurope action "accelerate e-commerce" and will improve the electronic reimbursement within healthcare organisations such as insurance funds, hospitals, General Practitioners, Pharmacists. This enables healthcare organisations to become a vehicle for electronic commerce and will enhance cooperation in an integrated European healthcare market in a harmonized and secure way.

e-Med shares the European Unions view that all European countries should be seen as an integrated part of the continent and of the current process of integration. Small business

in Europe will take advantage of the opportunities the e-commerce and the European Single Market offers to them. European healthcare business will be able to invest in the existing and especially, in the emerging markets, exploiting expanding opportunities and realizing unification targets. By building a sound European healthcare electronic market place, the European entrepreneurship will benefit from the integration of a harmonized and secure European infrastructure.

Within the health-care service system itself, positive effects on employment can be expected despite the fact that telecommunications and information technologies are often seen as threatening to substitute for human labour input. Health-care is an area of the economy where the volume of activity is significantly restrained by lack of resources. The better deployment of resources which e-Med systems enables help meet more of the demand without leading to release of staff. In addition, significant improvements in the working life of health care and social service professionals can be expected. The services concerned relieve pressure on the staffing of services during unsocial hours, as patients and insured people can be serviced quickly and effectively and a significant proportion of needs met without the need for second appearance. The e-Med solutions offer a host of ways to solve the administrative hassles that have plagued physician practices for years. New practice management systems are taking advantage of the data consolidation and integration the Internet affords to provide. Web-enabled management solutions that connect physicians to business partners, patients, and a broad range of medical and reference information. Easily accessible applications and integration of information on the desktop in the physician's desk can be a reality. Also:

- The system is user-friendly
- Alerts are generated more quickly and delivered to the pharmacist sooner
- Improved decision making and potential to intervene
- Improved communications between healthcare team members
- Positive impact on patient care by correcting problem drug orders more quickly

There is also specialized software available that enables healthcare organizations to efficiently collect, organize, and analyse patient-reported data. For example to get the critical information they need, rescue personnel will be able to rely on communication equipment that can quickly, accurately and securely relay medical information.

Better accessibility improves the degree of control staff have over the timing and content of their work, potentially - given the appropriate organisational context - improving the overall quality of their working life.

From the point of view of EU member states, deployment of health-care services promises very great savings in resources, with a significant increase in the quality of health-care reimbursement services. The savings due to the former effect reduce pressure on public budgets and enable Member States to reduce the taxes and insurance levies applied to economic activity, reducing the prices of goods and services and making the businesses concerned more competitive.

The major contribution to competitiveness comes from improved health-care

organisations management. Working hours lost by bureaucratic paper processes can be reduced. The improvement in overall staff availability can make a significant contribution to the effectiveness of companies in reacting to client demands, improving their competitiveness.

## **Conclusions**

The e-Med system aims to explore and exploit e-commerce informatics, including e-payment, and advanced telematics technologies in order to offer a context-sensitive solution to the exchange of administrative information in the healthcare sector. e-Med will reinforce the penetration of the healthcare administrative procedures to the digital economy processes and will stretch to embrace all parties involved in the reimbursement of medical services. The system will amplify the competencies of the organizations involved in the healthcare supply chain under the changing global economy, while being citizen-centered.