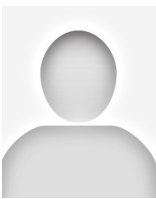
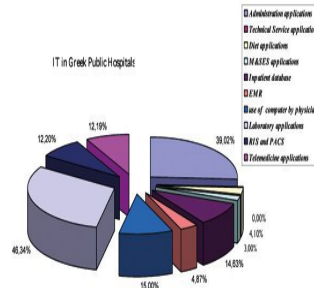


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### Hospital Informatics in Greece



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The current trend in innovative healthcare provision is the use of information and communication technology (ICT). ICT is totally affiliated with the development of added value. The implementation of informatics for the production and diffusion of intra-hospital medical information, where the collision between technology's rationalism and bureaucracy is usually met, is focusing on modernisation and improvement of healthcare systems. The basic unit of ICT in hospitals is the Department of Informatics (DI) but in most hospitals it is inefficiently developed, resulting not only in inadequate qualitative and quantitative profitability, but also limitations in the role of expediting or participating in outsourcing services, while in many "small" hospitals, DI does not even exist.

This article focuses on the problems of the hospital informatics department personnel. The lack of job description, which in combination with the resilient rule enforcement of hospital administration and the low implementation of statutory and organisational interventions, incur the demerit of informatics scientists as well as the information impact.

In the current era of increasing investments by European hospitals in the bid to become digital (the European Union expected that by 2010 five percent of national health budgets would be invested in electronic healthcare and services) the DI is going to have a significant contribution in the improvement of the technological organisation with hospitals.

#### ICT in Public Sector Hospitals

The usage of ICT applications in Greek hospitals started via the Mediterranean Integrated Programmes, carrying on with the second and third Community Support Framework (C.S.F.). The key point of the coherent actions was the great effort in bringing forward information systems in public hospitals. In addition, the development of the seven decentralised Greek Regional Health Divisions (DYPE) and the introduction of integrated hospital information systems that also include health centres, promised to change to a great extent the existing environment in the sector of public health.

Successful statistical analysis has been developed over the past decade about the adoption of computer science in public health sector. For example, statistical data of the Greek Information Society has shown that in 80 percent of Greek public Hospitals (GPH) DI do exist, but unfortunately they are inefficiently developed, while only five percent of GPH have upgraded the ID in Informatics Service, as they should, according the Greek legislation.

On the other hand a research that included 112 hospitals indicated that only 48 Informatics Professionals are graduates, 37 have studied in the technological sector institutes, and 141 are high school graduates. Likewise, recent research that took place in 41 GPH had the following results:

- The development of the ICT in GPH has been very slow. The largest percent of applications are totally concerned with administration actions, which are mostly text based and limited bandwidth, depending on the size of hospitals. More precisely, approximately 39.02 percent of hospitals are more likely to use isolated administration applications, resulting in many problems, such as: Multiple patient records, as well as multiple invoice registration by the pharmacy, financial department and medical and surgical equipment and supplies (M&SES) office.
- There is a lack of technical service applications.

- Patient diet applications have been developed up to a 4.1 percent of hospitals.
- In a very limited number of hospitals, approximately 3 percent, the processes involved in the M&SES and the consumables consumed by the patient during the daily transactions that occur in wards are handled. This results not only in the deficiency of the control system for these transactions, but also in the insufficient estimation of statistics based on the existing data, since charges of public insurance companies are still manually calculated.
- Merely 14.63 percent of hospitals have developed databases for inpatients which unfortunately have no interface with the hospital information system.
- Electronic medical record (EMR) is only deployed in 4.87 percent of hospitals
- Only 15 percent of physicians use computers in their daily work.
- 46.34 percent of hospitals partly use laboratory applications, while only 19.51 percent of them have implemented a laboratory information system (LIS).
- There is a lack of radiology information systems (RIS), as well as picture archiving and communication systems (PACS) in approximately 87.8 percent of hospitals.
- Only 12,19 percent of hospitals have adopted telemedicine technologies and remote monitoring systems, such as home-based care management. However it is very important to stress HygeiaNet strengthens healthcare in the region of Crete guided by the principles of universality, accessibility, comprehensiveness, portability and public administration.

Since 2006, according to Measure 2.6 of the ICT applications in health and welfare during the Information Society Operational Programme (OPIS), the completion of the introduction of information technologies (lab systems, patient records, etc) in the health sector is provided, so that the health and welfare services systems will be based on operational data. In addition, the development of information systems at health centres in order to implement an overall national health strategy, as well as the actions related to the preparation, selection, monitoring and assessment of actions and activities of the technical assistance and of the projects of the OPIS is provided. In addition, the service level agreement (SLA), in conjunction with the HL7 compliance denotation is setting the expectations between the consumer and provider concerning the guarantee for comprehensive support to hospitals through the realisation of patient management.

#### **ICT in Private Sector Hospitals**

In Greece, there are approximately 250 private hospitals and more than 350 medical centres as well as 20,000 private doctors and consultants. Contrary to the public sector, there is a great contribution of the private sector in health ICT projects, emphasising the need to provide their know-how in public hospitals. For example, the diagnostic and therapeutic centre of Athens Hygeia via a collaboration agreement with Harvard Medical International has developed an electronic medical record (EMR) system that supports compliance with practice guidelines and facilitates workflow through computer-aided documentation, prescription writing and ordering tests. In addition, the Onassis Cardiac Surgery Centre (O.C.S.C.), a hospital specialising in cardiovascular surgery and in diagnostic and interventional cardiology, is using HL7 capabilities to allow automatic interactions with other complementary applications.

Likewise the Medical Athens Group, as a member of European programmes DocMem and Telecare, has implemented a computer-based system that includes hospital information formats like order forms, patient records, status reports, information screens and medical imaging results as well as lab results. Also, the Central Athens Clinic is using a health information system that includes LIS, ERP and MIS, which facilitate workflow management including displaying and printing various test requisitions received from wards (ICUs, OT, Emergency, etc.), and out patient departments.

In 95 percent of private hospitals the DI belongs to the administration service and it is responsible for the development and maintenance of the collection, storage, distribution and analysis of all information within the hospital information system, being sufficiently staffed with administrative personnel consisting of employees who provide secretarial and technical support services for the operation of the department, as well as for outsourcing.

#### **Personnel Issues**

One of the major problems facing the personnel of hospital informatics departments is the lack of definition and regulation of their duties and responsibilities. This is a management disadvantage since very often many responsibilities that are not related to the real duties are assigned to informatics staff. For example, other departments' data processing like invoices and disposals of drugs and supplies, secretarial support of directors, as well as the processing of medical equipment databases are often assigned to informaticians.

The outcome of these assignments is the total demerit of informaticians, since this treatment results in staff disappointment and demoralisation, as well as an information impact reflecting organisational deficiency.

Another important issue is the pointless assumption that hospital informatics departments work for the financial services, possibly due to the fact that the application of IT began roughly at the end of the decade 1980 by using personal computers in some economic departments, like the payroll department. This organisational structure results in the problematic cooperation of the DI with the staff of other departments and in the difficulty of decisionmaking as well as in the unsuccessful management of informatics projects.

In addition, the annual evaluation of informaticians by the economic administration and not by the hospital manager raises the question whether the evaluation system is beneficial enough to employees. We need to be sure that job descriptions are current and comprehensive enough to develop and improve the skills required by these responsibilities, as those evaluating are not familiar with informatics.

Another important issue is that public hospitals inevitably like most public services have their administration regulated by specific rules. Indeed bureaucracy is based on the principle of cold rules priority, while the role of these rules in aiding implementation of hospital DI can be considered in various subcategories:

#### **Rules of Information:**

Rules of information determine eligibility for knowledge – who and what. For electronic patient records, decisions must be made as to who can access patient information and make additions and changes to it. Since an extremely important issue in the healthcare environment is medical confidentiality and patient privacy, mechanisms must be implemented to track the actions of users and prevent unclear or ambiguous situations.

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Questions that need to be answered include: Could the hospital ID correct erroneous records and registrations of the hospital pharmacy or medical charge office by oral request or it would be accused of data elements alteration?

#### **Rules of Jurisdiction and Process:**

Rules of jurisdiction determine the conditions under which various administrative decisions are taken or cancelled. These are necessary to accommodate changes in legislation. For instance, what is the process for advertisement of IT tender competitions or the judgement to reject or accept any bid if the decision committee is usually composed of inappropriately qualified persons? Even if hospital managers decide to allocate IT staff members to these committees it is impossible to find a sufficient number of people, due to the inadequate staffing of DI. In addition, the high percentage of non-specialised staff of DI results in unfavourable qualitative and quantitative job performance, like the identification of terminology standards that support a concept terminology and the participation in the design, testing, implementation and evaluation of management tools designed to support maintenance of concepts and clinical decision support knowledge assets.

It is obvious that the above technical challenges will require not only persistence and innovation, but also technical skills that are ensured by Bachelors and Masters Degree in clinical informatics, as well as by good analytical skills, well-organised and systematic in work processes and collaborative work in inter-hospital teams. However, in the manifesto of the open competition for hospital integrated information system, which aims to be a network application integrating the total management framework and relating to all operational programmes of the 3rd CSF, only 0.37 percent of personnel are graduated in informatics, a 0.3 percent are collegian, and 0.74 percent are high school graduates.

A key problem for hospital informaticians is the fact that any application of new IT projects could be threatened by human psychology, since for example, the older staff are afraid that their lack of fluency in IT use could expose them to their younger colleagues, or to their supervisors, since their performance would be monitored more closely. Cultural matters, as well as the training of IT personnel, and the usage of closed software are also major factors that negatively affect the staff attitude.

Perhaps these issues are the key reasons why 25 percent of hospital informaticians are planning to change jobs within the next five years, while 15 percent of them are planning to teach in public schools. This movement is also incited due to the retrenchment of the informatics bonus for DI staff during any furlough, except the usual one, or in case that they work in other hospital departments.

Another important point is that people who have graduated from Greek Institutes of Validation Technology (IVT) do not have the opportunity to find the jobs they are seeking in the public sector and they are not considered legal professionals, although many IVT have collaborated with major companies like Oracle, Cisco Systems and Microsoft that provided certification of knowledge on database issues.

#### **Conclusion**

The contribution of informatics in the provision of both medical information for decision-making and support to the process of knowledge-creation inside an anthropocentric hospital is undoubtedly a key asset that leads to technology transfer and improvement of Greek National Health System.

Although hospital informatics has been upgraded due to the prospective integrated information systems and project «Syzeffix» that aims to develop and update the public sector's telecom infrastructure, a lot of things have yet to be actualised. With ever increasing amounts of hospital information available it is becoming more important to be able to manage this information. The key here is to develop and maintain the role of the department of informatics to handle and properly control the vast amount of data and information.

In particular, DI has to convert to a hospital informatics service, and a pure job description for hospital informaticians must be formally defined. In addition, hospital DI should be adequately qualitatively and quantitatively staffed, while the economic motives, like a raise in Phd or MSc bonus could minimise the outsourcing.

Although the establishment of a National Chamber of Informatics could consolidate the role of informaticians, inside the less structured hospital it is first necessary to change the personnel's attitude through the acceptance of informatics achievements. This would serve to empower hospital administrations to observe the added value of informatics. The technology era we live in mandates that we should extend the current technologies with emerging ICT in the health arena, like access to heterogeneous distributed medical databases, and recognition for those who serve this arena. The Department of Informatics can and must take centre stage as the mechanism for information provision in the hospital world, only if it is administered by good managers and only if it is staffed with well-educated personnel

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