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The 21st Century Digital Hospital

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The Western Europe healthcare sector is dealing with different "inconvenient truths". The problem of skyrocketing costs is possibly one of the best known. However, other challenges too, loom large. The quality of services and delivery paradigms must be changed to tackle ageing of the society, chronic diseases or new pandemics.

Hospitals at the Hub of Healthcare Transformation

Within this wave of transformation, hospitals will be crucial as they are the most important providers of health services in Europe; in fact, according to the OECD and WHO, hospital spending absorbs around 34% of total healthcare expenditure in France and Germany and 44% in Italy.

A question of sustainability arises, and each European country that wants to address healthcare transformation should embark on a modernisation program starting from the hospital system. The modernisation must start with hospitals undertaking a deep functional change, overcoming their supply-side traditional organisation and transform into more efficient patient oriented organisations.

Some countries (e.g. France) have launched hospital reforms that encompass the improvement and measurement of processes, the introduction of funding systems based on case medicine and the application of evidencebased medicine tools in the delivery of care.

Growth in Information Dependency

These changes make hospitals more and more information dependent, thus increasing reliance on information and communication technologies. As a result, nowadays when we talk about the 21st century hospital, we talk about the "digital hospital".

ICT will enable information sharing between all the stakeholders involved in hospital processes and become the means to empower people and enable new processes where the patient is central.

Different Stages in Maturity

Digital technologies can be employed in different hospital areas and in different phases of patient treatment, from the registration of patients, to emergency and disease management, to discharge and billing. If we analyse the evolution of solutions proposed for hospital information systems, we encounter different maturity stages.

The basic health information system includes applications that are focused on hospital administrative processes, such as patient registration, admission, discharge and transfer, patient billing, human resources information systems, purchasing and financial reporting.

The second phase enhances the potentiality of the first stage, introducing electronic claims submission functionalities, electronic payment processing, inventory applications, basic order communications, email, Internet and hospital intranet. The clinical aspects are addressed only in a more advanced hospital information system entailing a laboratory information system (LIS), RIS/and radiology results reporting, PACS and operating room scheduling and management system.

Entering the True Digital Era

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The hospital enters the real digital hospital stage when information is shared within a single IT architecture, which is fully integrated with all hospital activities. At this point, the hospital wireless network enables it to fully leverage Computerized

Physician Order Entry (CPOE), electronic nursing documentation, department management system, an inpatient Electronic Medical Record (EMR) accessible through a physician and a patient portal, etc.

Once the perfect integration of technologies is achieved within its facilities, a hospital is ready to become a Digital Virtual Enterprise, and act as the hub of extended regional health networks enabling also home healthcare management through remote patient monitoring and telemedicine.

Europe's Landscape Still Fragmented

Compared with the above described maturity model, the European hospital sector landscape appears really varied and fragmented. There are countries like the UK where, through a massive and not simply manageable program, such as "Connecting for Health", hospitals are moving towards the digital hospital stage.

At the other end are some regions as in the south of Italy where hospitals do not have broadband connection and they hardly position themselves in the advanced hospital information system stage.

Asklepios: A 21st Century German Jewel

The Asklepios Klinik in Barmbek (Hamburg, Germany) can be considered an example of a hospital well advanced in its quest for the 21st century Digital Hospital.

Asklepios is a private hospitals union, which currently runs 92 clinics, acute care hospitals and rehabilitation centres in Germany and in the U.S. With the acquisition of the Landesbetrieb Krankenhäuser Hamburg (Hospitals Hamburg Land enterprises), Asklepios became the biggest union of hospitals in Germany.

The new Barmbek Clinic is the reference hospital for the "Future Hospital" program, the Asklepios project for modern healthcare. The new building has been provided with modern IT equipment to deliver increased efficiency through the transition from an institutional system to a patient-oriented informational approach.

The Future Hospital is a combination of design, processes, and technology to foster the optimal environment for employees and patients. This approach requires transparency, interoperability and standardisation of the entire treatment process.

The Strategic Role of IT and Communications at Asklepios

ICT has a strategic role in this transition from traditional departmentally oriented hospital organisation to a holistic patient-centric organisation. The network- and information-oriented approach provides a secure communication environment, which allow information sharing across the continuum of care and realie benefits from tools such as Electronic Medical Records (EMR), mobile point of care, picture archiving and communications systems (PACS), and clinical and management information systems (CIS/MIS).

The results of such an approach are already quite evident: productivity has risen – the amount of time a patient spends in the hospital has dropped by 0.7 days, which means higher turnaround and revenues – while quality of service has remained high along with the satisfaction of employees.

Barmbek sets an example of excellence, because of project management, ability to drive efficiencies through standardisation and long-term strategic outlook. What stands out in the Asklepios-Barmbek clinic modernisation program is a combination of leadership, collaboration among all employees and collaboration with the consulting units of IT vendors, which enabled the introduction of innovative approaches in direct and indirect cost analysis.

Consolidating the infrastructure on a single architecture increased efficiency, not only in terms of cost savings, but also in terms of releasing resources for more value-added activities and innovative IT solutions. Akslepios traditionally spent 80% of its IT budget for maintenance of systems and now targets reducing this to 60%, which will double the amount spent on innovation with the same budget.

Asklepios' decision to complement the hospital renovation with ICT modernisation demonstrated long-term vision and drove results that are impacting on the hospital's service outcome (e.g. quality of care, patient turnover, and an entirely new experience for patients and employees), well beyond IT efficiency. The Barmbek clinic can set a good practice not only for the rest of the Asklepios group, but also for other large hospitals throughout Europe that are thirsty for modernisation.

Outlook for the Future

Expectations from the benefits of application of ICT in hospitals are rising rapidly; however, technology is only a part of the solution and not a stand-alone answer. Cultural change, a key element in all transformations, will be even more important in hospitals than in other segments.

In fact, healthcare is a paradoxical world: it is one of the most innovative sectors, but at the same time one of the most reluctant in introducing innovation to its processes.

For example, while the high value that evidence-based medicine can add to the medical practice is widely accepted, its implementation has been slow due to the difficulty in obtaining data about the effectiveness of treatments, the challenges in disseminating results, and the inherent variation in patient responses and outcomes. In turn, the lack of data is mainly due to the fact that clinicians do not have the right incentives to collect it and are not fully conscious that the technology they are using is part of the process and not just a complication to their work.

The road to the 21st century Digital Hospital is promising, but is also a bumpy one.

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