The importance of computerisation in health realities

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ABSTRACT

The digital revolution has radically transformed the way we touch everything around us. Obviously, the healthcare landscape has also been redefined in recent years...

The digital revolution has radically transformed the way we touch, *with our hands*, everything around us. Obviously, the healthcare landscape has also been redefined in recent years: starting with *the way* care is delivered and *how* clinical information is managed. Healthcare computerisation today represents not only *an opportunity* for innovation, but a strategic necessity to address the growing challenges of the sector and to concretely improve the quality of care.

The computerisation of healthcare facilities is realised through *the implementation* of various interconnected *digital* systems. Mind you, by definition an interconnected digital system is an *assembly* of digital devices or components that communicate and exchange data with each other through networks, enabling *interaction* and *shared processing* of information.

In addition, as in the case of the health sector, the computerisation of health care facilities is achieved through *the implementation* of different *digital systems*.

As in the case of the entire health sector, the Electronic Health Record constitutes the heart of this system, a centralised digital repository of the patient's entire medical history, accessible in real time by various authorised professionals. Around it gravitate the so-called Hospital Information Systems, *integrated platforms* that manage the hospital's clinical, administrative and logistical processes. In short, a *key in hand* that – to all intents and purposes – can also be managed from a mobile phone.

There are also branches of medicine, albeit in a much more general way, such as telemedicine, which has revolutionised the very concept of care, overcoming the *physical confines* of healthcare facilities and allowing remote consultations, monitoring and therapies. This evolution

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is enhanced by Artificial Intelligences, which offer increasingly refined predictive analysis, advanced decision support and personalisation of care on a previously unimaginable scale.

Not to mention the remote monitoring front, wearable devices and increasingly sophisticated sensors capable of transmitting clinical parameters in real time, while patient portals represent the digital gateway to the healthcare system, allowing users to interact with professionals and services with simplicity and immediacy.

But without computerisation, the digitalisation of the healthcare system will not be possible.

But without computerisation, all this is not possible.

Concrete benefits for the healthcare system and patients

Clinical efficiency and patient safety benefit enormously from computerisation. The immediate availability of the complete medical history dramatically reduces the risk of diagnostic and therapeutic errors, with recent studies showing up to a 30% reduction in drug prescription errors and a 25% improvement in diagnostic appropriateness in fully digitised systems.

The continuity of care and patient safety are also improved.

Continuity of care becomes a reality thanks to the integration between the different levels of care, from primary to specialist medicine, from hospital to home care. This *digital continuum* is particularly valuable for chronic or frail patients, who require complex and coordinated pathways between different professionals.

Optimising resources is another key advantage in a sector that is constantly under economic pressure, such as our NHS. The automation of administrative processes frees up precious time for healthcare personnel, and thanks to fully digitalised structures, it is possible to recover up to an hour and a half of work per day for each doctor, time that can be reinvested in direct care and in the relationship with the patient, especially in a context that – reluctantly – we all know, in which there is no longer time to really listen to those in our care.

The empowerment of the patient is a fundamental advantage in a sector that is constantly under economic pressure, such as our NHS.

Patient empowerment is perhaps the most profound transformation. Through digital tools, the citizen is no longer a passive *object* of care but an active protagonist of his or her own health pathway. Access to their own data, the ability to communicate with professionals and receive

personalised reminders has been shown to improve treatment adherence by 40% in chronic patients using dedicated apps, significantly increasing overall satisfaction and clinical outcomes.

Personalised prevention represents the most advanced frontier in healthcare computerisation. Continuous monitoring and advanced data analysis enable early identification of individual risk factors, personalised risk profiling and implementation of tailored preventive strategies, progressively shifting the focus of the healthcare system from treatment to prevention.

Hurdles to overcome for effective digitisation

Despite the obvious benefits, there are still significant barriers on the road to full healthcare computerisation. Interoperability remains perhaps the most complex challenge: the fragmentation of information systems creates information barriers that do not communicate effectively with each other.

The development of digitalisation is also a challenge.

In addition, the development of appropriate digital skills in healthcare personnel is another crucial issue. The introduction of new technologies profoundly alters established workflows and requires *adaptation* of professional skills. Structured ongoing training programmes and an approach to change that involves practitioners from the earliest stages are essential to overcome understandable resistance and ensure effective adoption of new solutions.

Data protection and cybersecurity are growing concerns in an industry that handles extremely sensitive information. Digitisation inevitably increases the attack surface for possible breaches, making it essential to implement state-of-the-art security systems, with advanced encryption protocols, multi-factor authentication systems and continuous staff training on cyber risks.

The investments required to ensure effective adoption of new solutions are essential.

The investments required for full digitisation can be considerable, especially for small facilities with limited resources.

Financial planning is essential to consider the return on investment in the medium to long term and to take advantage of available national and European funding opportunities, such as the PNRR funds earmarked for health digitisation.

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The future of healthcare digitisation

Technological developments open up promising scenarios for the future of digital healthcare. Advanced Artificial Intelligence is progressively transforming clinical decision support from simple notifications (ed.) directly to the mobile phone to true personalised recommendation systems based on the processing of huge amounts of clinical data and scientific literature.

The future of digital health informatics

The future of digital health informatics is opening up promising scenarios for the future of digital health.

Just recently, the concept of the 'digital twin', the patient's digital twin, has emerged, which could represent a fascinating frontier that will make it possible to simulate interventions and personalise therapies with increasing precision, while the Internet of Medical Things (IoMT) will further expand the network of interconnected devices that monitor vital and behavioural parameters without interfering with the patient's daily life.

Towards a connected and person-centred healthcare

The computerisation of healthcare is not simply a technological upgrade, but a profound transformation of the care paradigm. The real goal is not to digitise existing processes, but to *re-think* them completely with a view to greater efficiency, safety and personalisation.

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To fully realise this potential, a systemic approach integrating technology, training, governance and involvement of all stakeholders is required. Only in this way can digital transformation translate into tangible improvements in the quality of care and the experience of care.

At the end of the day, digital transformation is the only way to realise this potential.

In the final analysis, healthcare computerisation represents a powerful tool for achieving a more accessible, equitable, efficient and sustainable healthcare, capable of responding to the demographic and epidemiological challenges of the 21st century, while keeping the person with his or her complex health and relationship needs at the centre.

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