

# DIGITAL HEALTH



## DIGITAL HEALTH IN MALTA

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### ABSTRACT

*This article looks at the most important advances that have taken place in the fields of healthcare computing, eHealth and Digital Health in the Maltese Islands since the Malta Association of Public Health Medicine was born in 1999. In the Health IT world, the jargon keeps changing, and it is now fashionable to speak of “digital health”, but in essence we are talking about the use of information and communication technologies for the provision of better health services. In Malta, public health physicians have been at the forefront of advances in Health IT, often acting as human interfaces between the medical and technological worlds.*

## The Late Nineties

In 1997, the first integrated Patient Administration System (PAS) was launched in Government Hospitals and health centres. This was a landmark development. Before then, computing activity in the health sector was based mostly on isolated PCs and modest local area networks.

This equipment had already started to bring benefit to health services. A computerised Patient Master Index had been created; not many readers will remember the manual index used in the eighties, housed in the so-called “magna” (machine) with trays full of little yellow index cards at St Luke’s Hospital.

At the Department of Health Information, epidemiological registers (such as those on mortality, cancer and congenital anomalies), hospital activity analysis (HAA) and the surgical register had been computerised. This was achieved through small but efficient dBase programs designed and built in-house. The HAA system and surgical register enabled greater use by hospital management of “solid data” in management decisions, and less dependence on perceptions.

The go-live of the PAS in April 1997, using a product from Shared Medical Systems called CliniCom, was a great leap forward, because of its ambitious scale involving all the Government’s hospitals and Health Centres. It involved the creation of an extensive Ethernet network spanning the whole St Luke’s Hospital/Karin Grech Hospital campus and setting up better telecommunication links with other hospitals and Health Centres.

On the hospital campus, an FDDI (Fibre Distributed Data Interface) network was introduced, using fibre-optic cable. It was one of the first large fibre-based networks in the Maltese Islands, implemented in close collaboration with the Government’s IT agency (MSU, later MITTS) and the hospital engineering department.

During the PAS project, the internet reached Malta, as well as technologies that made permanent wide area network links more efficient and reliable. The arrival of PCs in wards and clinics brought workplace computing within reach of many health professionals, and slowly but surely IT literacy began to grow and spread among the health workforce.

It was during these years that the first there was the first employment of people specifically for “Health IT jobs”. These included the health information system trainers and system administrators for the larger IT systems. This meant that IT work started to be given its due importance, instead of being seen as something that could be added on as an afterthought to someone’s job specification. The approach taken within the Health Ministry was soon emulated by other Government ministries.

## The Early Noughties

These years saw the consolidation of a lot of the work done in previous years. Further modules of the PAS were implemented, such as the one in the Accident and Emergency Department, and there were the first attempts to introduce new large IT systems (such as a laboratory system to replace the various stand-alone systems in the St Luke’s Hospital laboratories). Local area networks started to be introduced in other hospitals and departments across the Ministry of Health. There was also a steady growth in online communications.

## Mater Dei Hospital, and beyond

The period between 2003 and 2007 was dominated by the work done to prepare and launch new IT systems at Mater Dei Hospital. A comprehensive Information Systems Strategic Plan was drawn up in 2003, which formed the basis for a tender for an Integrated Health Information System (IHIS); this was published in 2005. A

fter a lengthy evaluation procedure, the tender had to be dropped early in 2007. From then on, Government focussed on procuring the IT systems and services that were most critical for the new hospital. The most important of these were the Radiology Information System (RIS) and Picture Archiving and Communication System (PACS), the integrated Laboratory information System (LIS), an Order Communications System and, very importantly, an HL7 interface engine which handled the exchange of structured messages between the major hospital IT systems, thus creating for the first time a truly integrated hospital information system.

These systems were originally meant for Mater Dei Hospital, and therefore most of them went live when the new hospital did, in November-December 2007 2017. However, the way in which the public health service in Malta works meant that the use of these systems needed to be extended to other Government hospitals and health centres, for the whole health service to function as well possible. This work took many years and led to the establishment of a nationwide health IT network.

## myHealth

The IT developments of the late noughties widened the information gap between the public and private health sector. In a bid to narrow this gap, the Government devised the myHealth portal, which allows patients and doctors of their choice to access specific types of medical records.

The myHealth service was (and remains) of special interest to private family doctors, who need to gain access to the IT assets in the public service. The first version of the myHealth service, launched in January 2012, provided access to case summaries, POYC entitlement, lab test results, medical imaging reports and POYC entitlement.

Initial uptake was limited by the fact that, for security reasons, access depends on having national e-ID credentials. These used to be difficult to get, and this limited the uptake of the myHealth service by the general public. When in 2014-2015 the national e-ID system was overhauled and new national ID cards were issued, myHealth took on a new lease of life, and usage started growing.

In 2017, a new version of myHealth was released. This was mobile-friendly, had a friendlier user interface, was available in both English and Maltese, and incorporated new sources of data, such as vaccinations. This led to a rapid growth in uptake that has so far continued unabated. By the end of January 2019, more than 60,000 patients had linked with doctors through myHealth, clearly making it one of the Government’s most important and successful online services.

myHealth has continued evolving, such as through addition of online ordering of laboratory and radiology investigations that is tightly interfaced with hospital systems, and is set to continue evolving, such as through the development of a Personal Health Record component under direct patient control, viewing of medical images and interfaces with new eHealth services currently under development.

## National eHealth services

In 2016, in order to address strategic eHealth needs, the Ministry for Health started working on a set of new national eHealth services. These were eventually included in the Government's "Connected eGovernment" (CONvErGE) [1] project, which aims to create and bring together several Information Technology (IT) service applications under one umbrella. This project is co-financed by the European Regional Development Fund (ERDF) [2], and runs until 2021.

The health components in this project include:

**National Electronic Health Records:** a software platform, backed by new legislation, allowing public and private healthcare providers to share patient data, in a controlled, secure and standardised manner, for the purpose of providing patients with continuity of care across the whole Maltese health ecosystem;

**Electronic Patient Records for Primary Health Care:** a comprehensive patient records system to replace the paper-based systems in Government Health Centres, that can also be extended to private family doctors;

**Health Data Exchange:** a new HL7 interface engine to replace the one implemented in 2007, capable of handling structured exchange of data between Health IT systems using a wider range of technologies;

**Patient Registries:** a system for the Directorate for Health Information and Research that will unify separate registries and provide more facilities for consumption of data through interfaces and for analysis and reporting;

**Patient Data Consent Management System:** a platform for systematic patient-centric recording of consent for access to personal health data in Health IT systems;

**Pharmaceutical Affairs System:** a system that supports the management of the Government formularies, medicines protocols and medicines specifications, that can interact with other systems within the national health ecosystem.

## Cross-border eHealth Services

Following successful participation in the second phase of the epSOS[3] project (2011-2014), the Ministry for Health made a successful bid for CEF (Connecting Europe Facility)[4] funds, in order to implement and deploy cross-border Patient Summary services between 2017 to 2020, to be used when EU citizens travelling between EU countries need unscheduled health care outside their country of residence. The Maltese services are expected to go live during 2019.

## eHealth Week 2017

During Malta's Presidency of the Council of the European Union, the Ministry for Health organised eHealth Week 2017[5], effectively taking the centre of the European eHealth stage. On 9th May 2017, the EU's eHealth Network held its 11th Meeting in Malta, discussing several eHealth policy issues, and deciding, amongst other matters, on the adoption of the form of words for a multilateral legal agreement (MLA) that is an essential prerequisite for the deployment of cross-border eHealth services between EU member states.

From 10th to 12th May 2017, 2,000 delegates from all over Europe and beyond met in Malta to discuss the most important eHealth topics of the day, unified by the theme "Data for health: the key to personalised, sustainable care". The eHealth Week Conference and Exhibition was a major collaborative effort between the Ministry for Health, the Presidency Unit, the European Commission, WHO's Regional Office for Europe and HIMSS (Europe).

## The future for Digital Health in Malta

Digital health in Malta is expected to play a pivotal role in the health services of the future. In the short to medium term, there will be the effects of the CONvErGE projects, especially the National Electronic Health Records and the Electronic Patient Records in Primary Health Care, both public and private.

In the longer term, there will be significant impact from scaled-up application use of clinical decision support, the Internet of Things (IoT), artificial intelligence (AI), genomics and pharmacogenomics. The paradigm shift from medicine which is centred around the health professional to an approach and modus operandi where the patient is fully integrated within their own care team is propelled forward by the advances in Digital Health.

Artificial Intelligence in healthcare has taken strides forwards since its early inception in the 1960s and today we see all forms of implementation in different clinical specialities such as medical imaging, dermatology, oncology and even public health.

Together with Big Data, we can use Artificial Intelligence to start detecting cancers using small amount of genetic material to assess the degree to which certain genes are expressed. In practical terms, the data generated by this genetic material would normally take hours to analyse but through AI, this process is reduced to minutes.

The advances and reduction in costs in the analysis of genetic material has opened the doors wide to further research in the field of genomics, where data on an individual level could inform the design of tailor-made drugs and inform doctors of potential adverse drug reactions before a drug is prescribed; a far cry from the trial and error approach experienced by so many patients and health professionals[6]. Genomics, in the context of Public Health Genomics, could even inform health policy on a national level and empower a highly-customised approach to public health interventions.

Taking it a step further, we see the advent and wide distribution of Internet of Things to devices such as heart monitors. These medical-grade devices would be directly connected to mobile networks using sim cards such as Nano Sims and eSIMs through specific networking spectrums. This allows the medical device to provide data from the device directly to remote monitoring platforms without any intermediary devices such as smartphones.

This enables health professionals to review their patients from anywhere, thus enabling patients to be treated in the comfort of their home rather than through irregular visits to hospital outpatients. Artificial Intelligence once again comes into play, supporting health professionals and alerting them at the right moment about patients who need attention and care, with a heightened potential to reduce unnecessary hospital readmissions and reducing healthcare costs.

## The role of public health physicians

It is no coincidence that this article has been authored by doctors who have specialised in public health. For the past thirty years, public health physicians have been at the heart of the most significant developments in healthcare computing, eHealth and digital health in Malta.

Technologies are of most benefit to humanity when they are applied to populations in a systematic way by persons who are professionally trained to care for others. On 10th May 2017, during the opening of eHealth Week in Malta, Dr Zsuzsana Jakab, WHO Regional Director, made a statement that resonated with everyone in the plenary hall: “we need a beautiful marriage between public health and eHealth.”<sup>[7]</sup> In Malta we have experienced the benefit of such a liaison for almost thirty years; may it continue long into the future.

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