

Chapter 39

Blockchain for Strengthening the Privacy of Healthcare Data

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ABSTRACT

The desire for eHealth systems is ever-growing as public institutions, healthcare providers, and its users see the positive gains from having systems of patient health information held in a single place; a decentralized connected architecture called blockchain. This concept can solve the interoperability issues and integrate the fragmented way healthcare records are held and present a more transparent, secure method to share data and protect patient privacy. The aim of this article is to provide a supportive environment for the health and social care workplace with special reference in the Primary Care sector in England on the impact and changes to the information governance toolkit (IGTK) as a result of the new European General Data Protection Regulation (GDPR) coming into force from May 2018. These challenges will also include the implementation of the National Data Guardian (NDG) review of data security and opt-outs amongst others.

INTRODUCTION

The National Health Service UK (NHS England) and other Healthcare systems everywhere are struggling. In England a number of factors such as; ageing population (many with complicated health issues), high cost, novel technology and relentless demand from internet savvy patients are creating a perfect storm, (Shu & Jahankhani, 2017). Therefore, the system has to strive to meet up with its demand by innovating

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new methods and techniques. Currently the support is applied in three ways; that is by monetary, tax or insurance. In 1948 the NHS England became the cornerstone of the health service in UK. However, now the system is struggling to keep to the demand and one of the setbacks being the lack of modernisation through the use of more smart technologies to deliver its services.

Historically, the health and social care system were not set up in a way that supports collaboration across services. Patients now have to tell their story multiple times, with staff from various organisations delivering different elements of their care, often then holding the data in disparate and silo systems, presenting an interoperability issue.

Individual organizations have had different priorities and separate ring-fenced budgets. This doesn't lend itself to health and social care services working as a unit, giving a seamless care experience for patients. At its worst, it has led to unhelpful competition and fragmentation, as each organisation works towards different priorities. This can be seen in the government's latest plan, "Sustainability and Transformation Plan (STP)", 2015 which is aimed to bridge the fragmentation and create more collaboration; (Madan, 2017).

The push for services to be situated in primary care is part of this, dissolving boundaries between general practice, outpatient services, community services, mental health and social care.

Many general practices (GP) are already operating at the limit of their resources and are now facing increasing financial and human pressures, needing to provide more responsive, flexible and accessible services to patients. GPs have to respond to a growing population with more complex needs, increasing prevalence of long-term conditions and an inequality in distribution of the workforce.

Whilst overall satisfaction with services remains generally high, a slower growth in general practice workforce, coupled with ever increasing demands on patient's access, means primary care services have a more critical role to play than ever before.

Patients see tremendous value in e-Health like patient online where patients will have access to their Summary Care Record (SCR), e-referrals, and online consultation - video technology.

It has been more difficult for patients to attend an appointment due to the necessity to travel, work commitments or childcare, based on their conditions and health needs, (Health Connect, 2016). Patients will now have the option to visit their GP virtually negating the need to travel and providing additional flexibility to do so. Though telephone consultation such as NHS England 111 and Out of Hours (OOHs) have been in existence for some time, both GPs and patients see the benefit of being able to see one another in real time via online video consultations thanks to cloud computing in e-Health. However, this technology is not provided by the current primary care clinical systems in use in general practice.

BLOCKCHAIN AND HEALTHCARE DATA PRIVACY

Patient data is retained in a multitude of provider silos as they move from one provider to another (Azaria et al., 2016) whereas it may be more beneficial to the patient if there was a transparent view of all events whatever provider was used. Data ownership, transparency and auditability looks to be common privacy issues as per Zyskind et al. (2015) in their work to position blockchain as a better method to protect and secure personal data.

Another issue with where the data resides is over the recent years the numerous attacks/data breaches the healthcare industry has suffered. These have ranged from ransomware to major data breaches exceeding 112 million records, (Munro, 2015). This point is important to consider, not just because of attacks, but

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