



# BLOCKCHAIN AND SMART ASSET MANAGEMENT IN THE NHS

The National Health Service in the UK represents a significant challenge both in terms of scale and increasing pressures on the estate. Karl Redmond and Paul Redmond, (SRO Solutions, Innovation), explain how Blockchain and Smart Asset Management can help.

**The NHS is the fifth biggest employer in the world with 1.5 million staff (NHS Choices 2016). It costs £139 billion per year to run (Harker 2017). The supporting estate is ageing, covering around 26 million m<sup>2</sup> (Naylor Report 2017) with running costs of over £8 billion per year (Carter Report 2016). As well as managing the performance of the estate, the NHS, as with most world healthcare economies, is dealing with the challenges of an ageing population, increasing demand - and cost - against a backdrop of constrained funding.**

A review of NHS estate data (Gorse, Shuckford and Redmond 2017) considered whether a 'performance-based' analysis could provide useful indicators regarding the efficiency of the existing assets for ongoing and future uses - keeping in mind the increasing

pressures already mentioned. The review indicated the need for more research in all areas impacting on or utilising the NHS estate. It also illustrated the potential of predictive analytics taken from reliable, verifiable, trusted and transparent data made available using digital innovation, such as IoT, Big Data Analytics and Blockchain.

Digital transformation within the entire facility management and property & estates market (not just the NHS) requires a new set of skills and behaviours, alongside a shift in culture that removes silos and provides end-to-end process thinking. Pockets of good practice, excellence and innovative thinking in the digital space exist, although there's also a need for greater understanding and learning. Unfortunately, these pockets of good practice and desire for learning are usually in silos, short-lived and come from those who

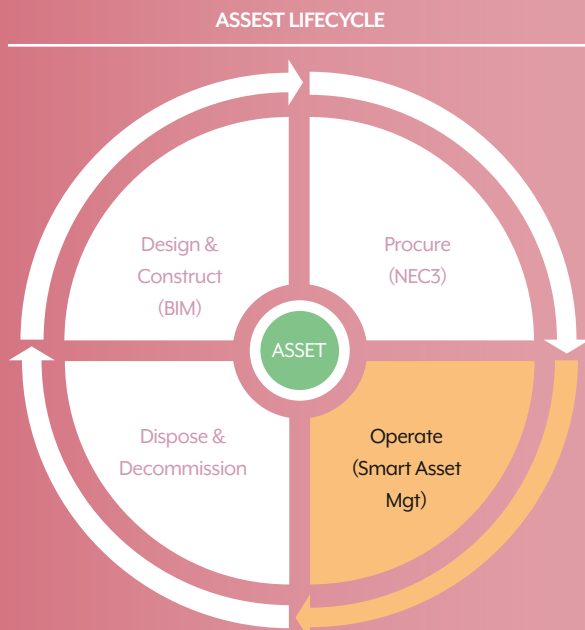
don't, historically, have enough influence at the decision-making table.

"In the UK, we add less than 0.5% to the value of our existing asset base each year. As such, the greatest efficiency gains are to be had in asset management, combining physical and digital systems to create truly smart infrastructure. This presents different challenges for owners of existing assets - who need to connect legacy systems to unlock operational efficiencies - and new owners created through major projects, who want to deliver best-in-class performance, fit for the next 50 years, in a rapidly changing technological landscape." Cambridge Centre for Smart Infrastructure & Construction et al. (2016).

## Technology that delivers business outcomes

We have all heard discussion or comments

## 80% of total cost of ownership of asset within operate phase



### IMPORTANCE OF SMART ASSET MANAGEMENT

- Operate costs typically cover: maintain, repair, replace, retrofit, overhaul, inventory and operations including energy consumption, service contracts, etc.
- Indirect cost impact influencing TCO include asset down-time, asset longevity and asset performance & maintainer / operations productivity
- Smart Asset Management will reduce TCO + enable IoT + integrate and automate procurement process
- Built on NEC3-4 & BIM foundations

*“One of the common problems in industry is the lack of integration between the digital and physical asset, and the mixing of their respective operational and performance data source”*

about the Internet of Things (IoT), Building Information Modelling (BIM) and more recently about Smart Contracts and Blockchain. However, to start bringing Big Data, property and digital innovation together there needs to be a desire and willingness to build bridges between OT (Operational Technology, that is, managing and controlling the physical assets) and IT (Information Technology, who have a better understanding of the ‘art of technologic possible’, and who manage/control networks, systems and security). Finally, both OT and IT must be backed and sponsored at Board level.

We know the technology works - it’s all around us and we read about it in magazines and articles. Most of us sense there are significant benefits to be had in transforming ‘dumb’ assets to ‘smart’ and maximising the resulting Big Data, and we get the additional benefits if this could be integrated with BIM, Blockchain, eprocurement and CAFM/CMMS systems. So is the problem in the ‘working-together’ and breaking silos, or is it at Board level? Or is it knowing where to start and understanding ‘the problem’?

One of the common problems in industry is the lack of integration between the digital and physical asset, and the mixing of their respective operational and performance data sources. Another one stems from the lack of joined-up thinking between various departments.

For NHS Estates, these problems can be exacerbated by a lack of holistic digital understanding regarding property asset/

facilities, and how it fits the broader clinical/patient need. Nevertheless, there also seems to be pockets of holistic technical competence and know-how, which can bring together all supporting information systems and physical asset data sets to help meet the NHS short and long term requirements.

With growing pressures on the NHS there is a need for a better understanding of the ‘art of technologically possible’, and the property/facility management sector cannot sit in isolation and hope to survive. There is a need for (re)training and educating estates and facilities on digital innovations and big data benefits, as well as providing support with necessary due diligence processes regarding holistic, end-to-end know-how.

#### **Smart Asset Management**

Smart Asset Management offerings can build on existing technology and processes utilised by facilities management groups from many sectors including the NHS. Utilising the potential of IoT has the capacity to unearth opportunities for NHS estates teams to improve productivity and maximise assets whilst transparently demonstrating cost savings to Financial Directors, Procurement leads and CEOs alike.

However, we need to create reliable, traceable and transparent data sets for these entities to have real confidence in predictive maintenance programmes as well as future capital programmes, rather than the subjective and unreliable approach we have all at times faced.

In order to create predictive maintenance asset management programmes (with the ability to include inventory and procurement programmes), NHS estates should consider incorporating an end-to-end digitalised operation that consolidates data from different systems throughout the asset’s lifecycle - for example, BIM, BMS/SCADA, CAFM/CMMS, ERP - into a single ‘platform’. It’s an approach very few have considered or are attempting. For those who are on that journey, the introduction of Blockchain to the end-to-end process from an asset/facility management perspective will improve transparency and traceability. This can only be considered a positive outcome for the entire built environment, as well as for the asset/facility management sector and, further downstream, for the supply chain.

#### **Smart Asset Management & Blockchain**

It is important to remember that a Blockchain is nothing more than a digital ledger or a sequence of data records, which is accessible and shared by multiple selected parties. The data stored can be anything from component purchase prices or specific details of assets, up to time-stamped records of an end-to-end fault-to-fix process that could underpin an entire ‘smart’ contract. All information stored in a Blockchain is encrypted, which means the data can be itemised so unauthorised use or tampering is virtually impossible. And once it is time-stamped, as part of a digital ledger, it is not possible to alter it, therefore ensuring the process is an indelible record of events.



The easiest way to think of Blockchain in an NHS estates and facility management context is to relate it to how we service and maintain our buildings and structures.

Today, most facility management programmes are either planned or reactive, or a combination of both. It is only recently that the wider facilities and estates industry has started to investigate the potential benefits of predictive maintenance. This is where the operating conditions of various critical assets and components are monitored to predict their failure (or a lowering of performance output) in the near future, leading to fixing the problem before they fail, therefore helping to prevent any unexpected downtime.

The application of Blockchain in this process will improve transparency and traceability of the asset and related facility management supply chain. Taking the concept further, it could be utilised to reverse-engineer and analyse the entire design, build and operating processes. This has the potential to link all the RIBA stages of work with a transparent, traceable and accountable approach to any and all capital projects, starting with the end in mind.

Once the fundamental concepts are understood, it is not difficult to imagine the Blockchain process being utilised to capture certification needs, insurance details and engineering compliance, therefore, for example, keeping trace of which certified engineer intervened, when, how long it took,

and ensuring only genuine parts are used for repair.

Certifications, insurance and compliance details can all be captured in Smart Asset Management offerings - Blockchain could check this and write confirmation to the digital ledger, only activating the next step if confirmation is approved. Through Blockchain this data could be shared with insurers/auditors by indicating that the process has been followed. Once again, this will offer NHS estates and facility managers more transparency in contracts, addressing the key aspects of time, cost and quality, ultimately leading to improved performance.

The introduction of Blockchain can help reduce uncertainty, improve clarity and transparency, and provide the basis for further improvements to the way in which data is understood and managed. The NHS estates and facilities sector has struggled to take advantage of the huge quantities of data available to improve the quality of services it delivers. Whilst Blockchain will not solve all such challenges, it has the potential to re-set our approach to data management, enabling quicker, clearer, lower risk and more effective decision-making.

NHS assets should ensure existing NHS assets and facilities are assessed, measured, monitored and cared for in a more sophisticated manner so they enjoy usefulness in line with our own life spans and beyond. Digital transformation and innovation agendas - big data, IoT, Smart

Contracts, Sensor Technology, Smart Asset Management, BIM/GSL and digital MRO - are not going away or replacing anyone. If these innovations are proactively approached they can be used to underpin and support what hard working NHS estates and facilities teams do by overlaying data sets, digital-physical-commercial-biological and more. We have an opportunity to radically improve and optimise the performance of all NHS estate and facility management programmes by linking digital/physical data sets, something we could all benefit from.

It is time for hard working NHS estate and facility managers and teams to learn some new skills and develop wider digital understanding. Start small, think big, move fast and look for the right partner to help you on the journey. NHS estates and facilities teams have all demonstrated technical and professional competence for many years and we cannot afford to lose the experience many of them have in abundance. Smart Asset Management, IoT and Blockchain alongside holistic thinking, digital innovations and big data opportunities across the NHS estate and facility environment will significantly enhance the individual's ability to manage the performance of the estate, against the backdrop of constrained funding, an ageing population and an increasing demand to do more with less.

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## BLOCKCHAIN & ASSET MANAGEMENT

