



# Unleashing the Digital Premium

A report from the Good Governance Institute (GGI)

February 2020



## Good Governance Institute

The Good Governance Institute exists to help create a fairer, better world. Our part in this is to support those who run the organisations that will affect how humanity uses resources, cares for the sick, educates future generations, develops our professionals, creates wealth, nurtures sporting excellence, inspires through the arts, communicates the news, ensures all have decent homes, transports people and goods, administers justice and the law, designs and introduces new technologies, produces and sells the food we eat - in short, all aspects of being human.

We work to make sure that organisations are run by the most talented, skilled and ethical leaders possible and work to build fair systems that consider all, use evidence, are guided by ethics and thereby take the best decisions. Good governance of all organisations, from the smallest charity to the greatest public institution, benefits society as a whole. It enables organisations to play their part in building a sustainable, better future for all.

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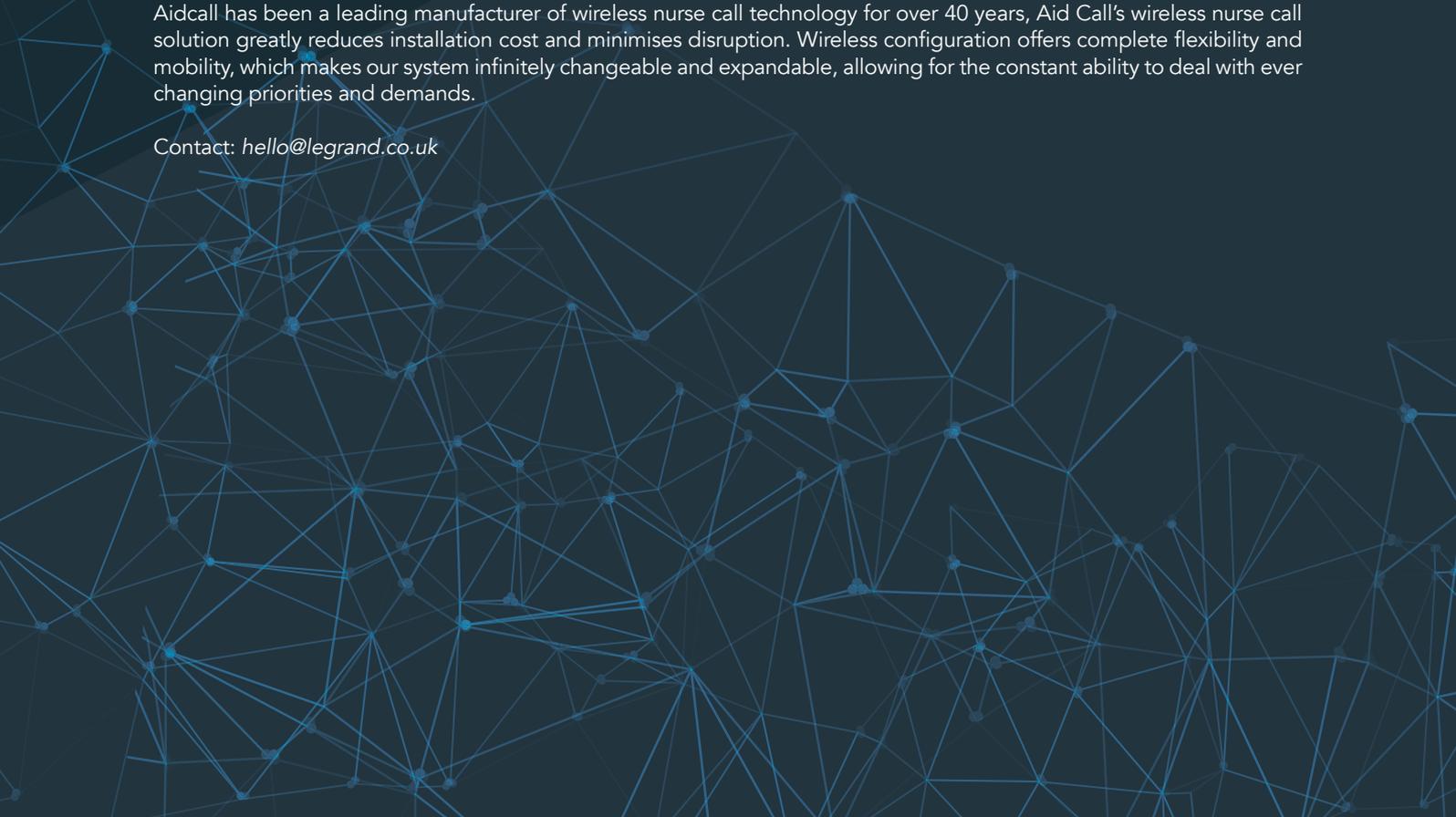
Legrand are global experts in electrical and digital building infrastructures, with a presence in over 90 countries. The Assisted Living & Healthcare business unit specialises in creating innovative technology based care solutions for health, housing and social care sectors through our brands Tynetec, Jontek and Aid Call.

In this day and age, we're all living longer and as a consequence, the care and health services we rely upon need to change in order to support more effectively, those who are vulnerable or at risk.

Tynetec's digitally enabled at-home alarms and telecare devices work seamlessly together to empower individuals in their own homes. Our grouped living and access control systems are designed to ensure that local authorities and housing associations have flexible future proofed support for their residents. And we also offer a true digital end to end solution with our Answerlink monitoring and response center software.

Aidcall has been a leading manufacturer of wireless nurse call technology for over 40 years, Aid Call's wireless nurse call solution greatly reduces installation cost and minimises disruption. Wireless configuration offers complete flexibility and mobility, which makes our system infinitely changeable and expandable, allowing for the constant ability to deal with ever changing priorities and demands.

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# Unleashing the Digital Premium

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## Foreword and acknowledgements

Our mission at GGI is to help create a fairer, better world. A core aspect of achieving this is exploring important issues of the day and providing stimulus and guidance for those tasked with leading organisations. We have developed reports and assurance tools for boards on population health management, long-term conditions, telehealth, and new care models.

In this paper, we turn our attention to digital technology, which has a pivotal role in helping us to improve and sustain outcomes for our communities, with enormous potential for positive impact.

Legrand Assisted Living & Health Care has a track record of excellence and innovation in this area. We were delighted to be approached by Legrand in the Autumn of 2019 with a grant to develop a national white paper exploring the digital premium. We have done this with invaluable input from colleagues across housing, health and social care, technology providers, and government.

The paper sets out the case for unleashing the digital premium in order to achieve innovation and radical impact, beyond minor efficiency gains. A set of strategic prompt questions are set out to support board-level discussions.

GGI would like to thank Legrand Assisted Living & Health Care, as well as all those who so generously contributed their time to take part in the discussion events and interviews that have informed its content.



Andrew Corbett-Nolan  
Chief Executive  
Good Governance Institute

## Definitions of terms used in this report

**Artificial intelligence:** (AI) “Refers to a broad field of science encompassing not only computer science but also psychology, philosophy, linguistics and other areas. AI is concerned with getting computers to do tasks that would normally require human intelligence.”(van Duin, S & Bakshim N, 2017)<sup>1</sup>

**Data point:** A data point is a discrete unit of information. In a general sense, any single fact is a data point. In a statistical or analytical context, a data point is usually derived from a measurement or research and can be represented numerically and/or graphically.

**Digital medicine:** Digital medicine is defined as digital products and services that are intended for use in the diagnosis, prevention, monitoring and treatment of a disease, condition or syndrome including technologies such as telemedicine, smartphone apps, wearable devices, software used in clinical settings (such as e-prescribing), point-of-care tests, and extended reality technologies (including virtual reality and augmented reality).<sup>2</sup>

**Digital premium:** The benefit gained through proper implementation of digital technology to the individual, locality and system.

**Data quality:** The specific characteristics that determine the reliability of information for its intended use. High quality data enables organisations to generate more reliable and accurate insights.<sup>3</sup>

**e-health:** The use of information and communication technology in provision of healthcare.<sup>4</sup>

**Health informatics:** The practice of acquiring, studying and managing health data and applying medical concepts in conjunction with health information technology systems to help clinicians provide better healthcare. Health informatics is the use of computer technologies in healthcare to store, share, transmit and analyse clinical knowledge and data.

**Machine learning:** Process that analyses data sets for patterns and behaviours in order to support intelligent, data-driven, decision making based on new knowledge and understanding.

# 1.

## Context

Reading the opening paragraphs of any planning document or business case in the world of UK health and social care from the past few years, you would be forgiven for falling into déjà vu despondency.

The challenges facing the sector are well documented: rising and increasingly complex demand driven by demographic change and socio-economic inequalities, all within a context of ever-tighter financial and resource constraints.

The pressure on health and care services continues to grow due to increasing demand from an ageing population with long-term conditions and comorbidities, an overuse of acute services, and a steadily widening gap in health inequalities – all exacerbated by chronic staffing and funding shortfalls.

In particular, supporting older people to maintain their independence, wellbeing and dignity at home for longer is a recognised priority for communities throughout the UK. Improved digital technologies mean that there are more opportunities to enable independent living and access to care as close to home as possible. The shift from analogue to digital is an important illustration of the progress made in the availability and impact of technology to support these aims.

As TSA Chief Executive Alyson Scurfield reflects:

*Moving from analogue to digital is about more than a simple replacement. It's an opportunity to fundamentally redesign technology enabled care (TEC) services and use digital connectivity and data to provide preventative, proactive care.*

*Although the switchover brings opportunities, it also presents challenges. The resilience of digital connections, the reliability of new devices, data accuracy and security must all be assured. Immediate collaborative action is needed to avert significant disruption to telecare services.*

A range of integration and collaboration efforts are already underway to tackle these challenges of delivering effective and efficient care and supporting community wellbeing. Integration and 'new ways of working' have been identified as national policy priorities across the NHS and local government, and partners are working to join up the commissioning and delivery of health and care services across neighbourhood, place, system and region.

There is growing recognition that the required improvements cannot be achieved by delivering services in the same way, or even just more efficiently. A new approach is required. The desire of dedicated teams to support families and communities to live healthy independent lives is palpable.

Much work is underway throughout the UK to help people live longer in the place of their choice - usually their own home - to avoid the personal disruption and cost of unnecessary hospital visits, and to get home sooner when more specialist care is needed elsewhere.

## ■ The role of technology

Technology is a core enabler for the delivery of this high quality, sustainable care. Our ambitions for healthy, lengthy lives for ourselves and our families can be greatly aided by technology and digital services.

The rate of technological development presents both challenges and crucial opportunities to those leading and delivering housing, health and care services. Examining those opportunities and addressing some of those challenges is what Unleashing the digital premium is all about.

In his review of the potential of digital technology for the UK health sector *Preparing the healthcare workforce to deliver the digital future*, published in February 2019, Eric Topol, Executive VP and Professor of Molecular Medicine at The Scripps Research Institute, suggested that the UK sat at 'a unique juncture in the history of medicine' thanks to various technologies including artificial intelligence, genomics and biosensors, all underpinned by a digital infrastructure.<sup>5</sup>

He wrote: "This remarkably powerful set of information technologies provides the capacity to understand, from a medical standpoint, the uniqueness of each individual – and the promise to deliver healthcare on a far more rational, efficient and tailored basis."

The potential exists to use digital technology to integrate the worlds of housing, health and social care to create a more holistic system that eases the pressure on overburdened services and improves the lives of some of society's most vulnerable members.

Crucially, this is technology that is generally already available. This report is not a utopian forward vision so much as an examination of what is largely possible today. As we will outline below, many of the barriers standing in the way of widespread deployment of this kind of transformational digital technology are cultural or regulatory rather than technical or financial.

This report highlights some of the important choices and opportunities facing leaders as they explore how to embrace a new era of digital services which can deliver long term benefits to communities throughout the country.

## 2.

# Data rich intelligence poor

The intelligent use of the insights provided by data has a huge role to play in improving health and wellbeing outcomes. Enormous quantities of useful data are already being collected from a wide range of sources. When these data sources are integrated and analysed, they create powerful and informative data sets that are already being used to improve health and wellbeing outcomes in many ways.

In the housing sector,<sup>6</sup> for example, digital start-up Homelync<sup>7</sup> helps social housing landlords reduce costs and improve the service they offer tenants by integrating information gathered by devices such as smart boilers, connected smoke alarms, voltage optimisers, solar panels, water leak detectors and air quality analysers. By gathering data on temperature and humidity, for instance, landlords have a much clearer picture of the timing and nature of likely repair and maintenance work. This makes it easier to manage properties in a coordinated, cost-effective way.

In the health and care sector, partners are working together to harness the potential of data and digital at scale. Nascent Integrated Care Systems in the east of England, for example, are working together through the East Accord collaboration of six STPs and partners across the east of England region to support a mature digital economy across health and social care in order to reduce inefficiencies and improve patient experience. Initial priority areas for collaboration include delivering integrated care records, developing procurement at scale, and supporting skills and capability development across the region.

And in social care, community care provider Manor Community adopted the enterprise communication tool MS Teams<sup>9</sup> to improve the way staff shared information, moving away from text messages and WhatsApp. The tool's collaborative updating functionality makes it quick and easy for Manor Community staff to share information about the people they care for, highlighting important observations or actions about service users for the right teams to look out for and enact, irrespective of how often those teams meet face to face. This is a significant step forward in the social care sector where domiciliary care workers don't often see their colleagues or managers who care for the same service users and therefore have to rely on technology to communicate useful information.

Currently, organisations across the health, social and housing sectors do not and cannot use all the data collected effectively.<sup>9</sup> However, the potential is there to make an enormous contribution to improving health and wellbeing outcomes.

### **The data integration challenge**

Integrating multiple data sets from different sources is a major challenge. There are significant hurdles to negotiate before we can rise to this challenge, including improving how data is collected, acquiring the skills we need to integrate it effectively, and addressing the risk of data excess. Until we overcome these hurdles, we will continue to be data-rich but intelligence-poor.

First, there are considerable differences around the country in how data is collected, and in the digital maturity of health, care and housing services. Too many health and care organisations still largely rely on paper-based systems - with some reports suggesting just one in ten NHS trusts are fully digitised.<sup>10</sup> When data is collected, it is often not integrated with other information to provide the insights that can positively transform services and outcomes for communities. Geographical gaps in digital maturity exist alongside siloed working within and between sectors of health, care, and housing.<sup>11</sup>

Second, high levels of skill are required to turn the data into usable information and to reap the potential benefits of machine learning and artificial intelligence (AI). While digital systems can enable the delivery of this insight the workforce also needs to be appropriately trained and supported to maximise system potential.<sup>12</sup>

Third, there is a risk of collecting an abundance of data and creating a 'data blizzard' which does not offer value or deliver impact. This issue of information over-abundance and the associated danger of overload also raises questions of information governance, data ownership and ethics – all topics that will be further discussed in this paper.



# 3.

## Unleashing the digital premium

The potential of digital technology to improve the efficiency and effectiveness of public sector health and social care services is enormous, but unlocking this potential means overcoming significant challenges.

Budgetary and resource constraints, cultural and regulatory blocks, and the sheer scale of deployment all represent significant barriers to unleashing the transformative potential of big data, artificial intelligence, and mobile and cloud-based technologies.

There is growing recognition of the collaborative potential of integrated systems and a more joined-up approach – and indeed there are many examples of this sort of technology being used to great effect already – but there is a long way to travel on this transformative journey.

The resource implications in particular are complex, cutting across sectors in ways that might not be immediately apparent and can be difficult to reconcile. Incorporating the latest digital technology aids into new sheltered housing builds, for example, adds considerable cost. But a lack of such technology means that residents are less able to fend for themselves at home and may have to visit hospital more often. With every elective hospital case costing around £4,000 and every extra day as an in-patient costing nearly £400 in 2018/19, failing to install such technology seems like a false economy.<sup>13</sup>

In response to national policy imperatives, a range of integration initiatives are underway throughout the country. Data innovation has been identified as a priority by Secretary of State for Health and Social Care, Matt Hancock, who said in 2018: “Because we are one NHS, our health system is uniquely placed to become the most advanced health system in the world – one where technology addresses the user need – making care better for patients, but just as importantly making life better for staff.

“For too long, decisions on health and care have seemed to involve a trade-off – improving patient outcomes at the expense of placing ever more pressure on staff, while reducing the demands on staff has been seen to have an impact on patient care. Technology and data innovation offers an opportunity to move past this binary approach.”<sup>14</sup>

This national policy focus offers the potential of a supportive platform for the integration not only of health and care services, but for the adoption of innovative ways of working across areas with historic organisational boundaries. It is well understood that housing, employment, and positive social connections all have a defining impact on health and wellbeing.<sup>15</sup>

Realising the digital premium at a scale which supports improved and sustained wellbeing outcomes will require investment and collaboration beyond the remit of those delivering direct health and care services. This means close working between local authorities, housing associations, the NHS, voluntary sector and commercial partners in a local area.

### ■ What is the digital premium?

The digital premium refers to the potential that digital technology has to deliver more cost effective, efficient and reliable services. It can do this by preventing issues in the first place, by offering greater flexibility in the delivery of services, and by giving the recipients of these services more independence for longer.

These key themes of **prevention**, **flexibility** and **independence** apply in numerous ways across housing, emergency services, and health and social care in the public, private and third sectors.



### **Developing homes as digitally-enabled health and wellness monitoring environments**

As we have seen, there is growing focus from both local government and the NHS on more community-based care which adopts population health management approaches of prevention and personalisation, often supported by technology enabled care. The nexus for much of this community care is in people's own homes, along with supported housing and care homes.

Housing is a vital site for unleashing the digital premium. Technology-enabled care in the home is an area that residents and service providers are looking to in order to reduce unnecessary hospital admissions, improve independence, and encourage general health and wellbeing. Within supported housing and care homes, digital support is seen to offer opportunities to enhance safety and increase resident freedom.

The strategic case for investing in digital technologies across the housing sector is clear, offering the potential for large scale benefits in other parts of the system by reducing demand pressures on strained health and social care services, and supporting independence and wellbeing within communities. The forthcoming analogue shift, whereby phone services in the UK will be replaced by digital connections, provides a timely opportunity for transformation in housing providers.

These efforts cannot, however, be left to the housing sector alone. With the OECD predicting that health spending is set to outpace GDP growth to 2030, achieving effective and affordable care requires strategic collaboration and new ways of working across traditional organisational and sector boundaries.<sup>16</sup>

In order to achieve the positive impact presented by the digital premium, we must encourage the building of effective working relationships locally between health and housing, and explore opportunities for joint commissioning of housing services with the NHS, local authority, and industry partners.

As ever, involving residents in discussions and decision making about digital implementation will be key to achieving successful outcomes, as well as navigating important ethical concerns which may exist in relation to privacy and the use of data. Similarly, staff engagement is a crucial enabler to the successful realisation of digital benefits. As highlighted by the International Journal of Nursing Studies in relation to care home staff; "training might need to move beyond functional instruction to include deeper exploration of anticipated benefits and the underlying rationale" for using digital technologies.<sup>17</sup>

Stephanie Butterworth, Executive Director of Adult Services at Tameside Metropolitan Borough Council reflects on the value of an integrated approach to technology in enabling independence and comfort for local communities:

*Telecare in Tameside underpins our primary aim of supporting people to live well at home. This includes people living as independently as possible, co-producing how they are supported to meet their needs, giving them control of their lives, and using technology to maximise independence.*

*Our range of telecare devices are put together in a tailor-made package to suit the needs of the individual. When a device is activated, our team of dedicated staff aim to respond within 20 minutes. We carry specialist equipment in our vehicles, which may be utilised to lift an individual who has fallen, if it is safe to do so, in many cases preventing the need for attendance by an ambulance.*

*Our integrated approach to working with the Digital Health Team affords us the facility to use Skype to interact with a team of medics, who can see and speak to a person in their own home if they are feeling unwell or worried about their health, and offer the appropriate support and advice, including the monitoring of vital signs. Also operating in partnership with the Digital Health Team is our Telehealth service, which supports people living at home with Congenital Heart Failure or Chronic Obstructive Pulmonary Disease, through regular monitoring of their specific long-term condition.*

*Whilst supporting almost 3000 vulnerable people across the borough to live independently in their own home with the use of telecare equipment, I firmly believe that our approach in Tameside goes much wider; not only are we able to offer reassurance to those individuals, but, ultimately, we are able to provide families and carers with reassurance and peace of mind by knowing that help is available at the push of a button!*

Hannah Fleck, Service Manager for Community Wellbeing at Conwy County Borough Council further reflects on the challenges and opportunities of telecare created by the change from analogue to digital connections.

*Conwy County Borough Council recognises the importance of telecare as it supports our residents, both those considered vulnerable and our less vulnerable residents, to be and feel more independent. As a result they are able to enjoy the lives that they want to lead so rather than feeling restricted and unable to go out because of the worry of "what if?".*

*As we move away from analogue into digital communications we need confidence that we will be able to support a wider market of support items, which don't have to come from a single supplier. We want to be able to identify the most appropriate piece of support kit that is going to help you to retain your independence, rather than saying "this is what we have got, it is limited but this is what's available". Helping people to be able to find a solution that fits them and then in turn to be confident that we can make the system work to answer and monitor that specific item.*

## **Robot nurses**

To take a futuristic example of the digital premium in action, US not-for-profit innovation company CableLabs is developing an intelligent robot that will serve as an in-home companion and nurse.<sup>18</sup> The robot would be capable of social interaction and may even be able to build a rapport with the person it is caring for. The technology could ensure that patients get the right treatment and drugs and could monitor their movements in case they fall or suffer some other medical emergency. Data captured by the robot would be analysed and shared over the high-speed network with health professionals and the patient's relatives, ensuring a supportive dynamic between 'tech' and 'touch'.

## **Switching to iPads**

But unleashing the digital premium doesn't necessarily mean investing heavily in state-of-the-art technology.

One social enterprise community healthcare provider says a straightforward switch from pen and paper to iPads for the gathering of patient notes in the community had a transformational effect on his business. Raoul Pinnell, Chairman of Bromley Healthcare, said: "When we made this change six years ago, it represented a big commitment of time, effort and money. But it's made a huge difference to us – and, more importantly, to our patients.

"Before we adopted iPads, our nurses would typically write everything down in a paper-based record in a patient's home before transferring the information to a PC back in the office. Now they start with a preloaded patient record on their iPad which can be updated and shared, for example, with GPs in real time. The move to iPads has also resulted in us being able to incorporate more easily updated clinical protocols such as questions related to hydration and nutrition which might improve recovery rates. "At the same time we moved to sharing 'One Record' with GPs and introduced a 'single point of access' referral form for GPs to facilitate multiple referrals.

Notwithstanding the improvements that all of the above have delivered in patient care, there has also been an increase in staff productivity. This is critical as staff account for 85% of the company's expenditure. Part of this increase is a result of being able to use the data to anticipate demand more accurately and reduce the costs associated in having to employ agency staff who incur a 20% premium."

The next step in the use of iPads has been a new set of data to assure us what we have achieved in any given day. As we look to the future we are exploring how we could add other information e.g. weather forecasts to help us to improve our predictions in the demand for specific services."

### **Simple but effective - Dorothy's pendant alarm**

Dorothy and her pendant alarm is another example of the way relatively basic technology can make a big difference to people's lives.

Sixty-eight year-old Dorothy was on one of her weekly shopping outings with her sister when she tripped on an uneven pavement. She put her arm out to break the fall and broke her wrist in two places, then fell forward breaking her shoulder in three places. An ambulance took Dorothy to hospital, where the consultant orthopaedic surgeon explained that she'd need surgery to add a metal plate to her wrist. Surgery couldn't help with her broken right shoulder so she was advised to wear a sling and cuff and allow it to heal over time.

Because she lives alone, Dorothy was kept in hospital for three weeks until the surgery could be performed. After surgery, the hospital would only allow Dorothy home if someone stayed with her and appropriate care measures were in place.

Dorothy's care manager wanted her to stay in a care home, where she could have someone on hand to help 24/7 but Dorothy was very keen to return home.

As part of her care plan she had carers visiting her home four times a day to help with feeding, dressing etc. Dorothy's sister-in-law also stayed with her to help out. But it was only possible for Dorothy to stay at home because she had a pendant alarm connected to a call centre.

Knowing that Dorothy could press the button at any time to request assistance gave her and her family enormous peace of mind as she recovered.

### **The power of prevention**

Preventative monitoring can reduce risk and improve the safety of frail and vulnerable people. Using technology to provide proactive predictions means healthcare professionals can be notified of changes in behaviour, gait or habit, enabling them to take action before a more severe illness sets in. This can reduce the need for higher cost care and reduce trauma and its adverse effects.

A growing number of sheltered housing providers have identified that digital technology can provide innovative ways to ease budgetary pressure and provide a better service and a more comfortable environment for residents. But by broadening their outlook, some providers are finding they can do even more.

Jeremy Porteus, Chief Executive of Housing Learning and Improvement Network (LIN), says: "Sheltered and extra care housing providers have the opportunity to change the way they interact with residents, moving away from the traditional mode, a largely reactive approach to dealing with a crisis, towards a model that enhances providers' service offer. For example, using technology much more proactively, as a data gatherer to help deepen understanding of residents' needs or a data sharer to signpost potential health and social care issues earlier and to data assist, to trigger interventions or improve self-diagnosis that ultimately improve their quality of life."

## Taking the heat out of false fire alarms

John Black of the Scotland Fire & Rescue Service community action team sees enormous potential in the preventative power of technology. He says: "In this age of the connected world and the internet of things, it should be possible to use data to prevent both real fires and false alarms. If we were able to access data about who's not using extractor fans properly, for example, we could identify potentially vulnerable people and target our activities much more effectively."

This kind of technology would quickly pay for itself. False fire alarms account for 41% of all call-outs across the UK at a cost of more than £1bn per year, according to Fire Industry Association (FIA) estimates. Black says each false alarm callout costs around £1,000 and potentially diverts resources from real emergencies. He says: "Of course we must attend every call – we have no idea if it's going to be genuine until we get there. We go out into the community to speak to residents and housing providers about how to minimise false alarms but of course you can't speak to everyone – and that's where technology comes in, for example in the form of more sophisticated alarms that won't be triggered unless they detect the particular gases in the air that you find in fires."

## Population health management tool

The Ribera Salud is the main healthcare provider in a public private partnership that's been providing healthcare for 550,000 people in the Valencia region in Spain since 1997.<sup>19</sup> Its flexible model provides healthcare based on needs at any particular time. Aiming to improve clinical and financial outcomes and to solve organisational problems such as staffing levels and other inefficiencies, it uses information and technology in a variety of ways.

Ribera Salud developed a population health management tool that clarifies patient demographics and makes it easier to identify health risks and proactively improve healthcare provision/outcomes. Using data points from public and private hospitals in Spain, the factors contributing to a patient's health such as age and previous health history are considered and analysed in order to understand their risk of becoming ill at any given time.

The Ribera Salud has also digitally integrated health records that are electronically shared between primary care, hospital and the patient. A secure online portal coordinates care and provides the patient access to information about their condition, including things such as test results, of which more than 20,000 have been uploaded.

Patients can also add data about their conditions to be shared with their doctor. Patients can manage their own health activities, book and reschedule medical appointments, or use the system to communicate with medical professionals.<sup>20</sup>

This not only promotes patient proactivity and engagement, but has improved communication between patients and doctors, reduced unnecessary hospital visits by 5%, and improved continuity of care. It also enables patients to access their own health data in any Ribera Salud doctors office or at home, allowing flexibility in care provision.

Population health management approaches are a growing focus within much of the UK public sector, as GGI explored in our report, *How population health management will deliver a sustainable NHS*.<sup>21</sup>

## Award-winning data sharing by London Ambulance Service

The London Ambulance Service, the only trust providing services across the whole of London,<sup>22</sup> picked up an award in October 2019 for a data sharing pilot scheme aimed at providing real-time information on patients while on the move.<sup>23</sup>

From April 2019, 74 crews based at Camden Ambulance Station became the first users in the country to be given access to patient summary care records (SCRs) on secure iPads. The SCRs include patients' medical history, key personal information and any current illnesses, giving medics the information they need to deliver the best possible care, whether that's treating them on the scene, taking them to hospital or referring them to care in their community.

NHS Digital has said it expects that early access to this key information while patients are in pain or distress will shorten the time medical staff need to spend with patients and reduce A&E admissions.

“By being able to securely access patient information on a tablet device at the patient’s side, our clinicians will have more information at their fingertips, enabling them to provide better and more informed care,” said Stuart Crichton, Chief Clinical Information Officer at the London Ambulance Service.

The pilot is now being rolled out across the capital for all frontline London Ambulance Service medics and the possibility of using the mobile tool in different care settings is also being explored. There are also clear potential benefits of rolling out a single standardised approach to data sharing across all ten NHS ambulance services in England.

But it’s not just patient information that’s of potential use to ambulance crews. Last year, a study by King’s College London found that data from outside the NHS, such as information on weather and traffic conditions, could be vital to improving ambulance services.<sup>24</sup> The report noted that the London Ambulance Service and government should partner with Transport for London (TfL) to get near-real-time traffic data to allow them to better navigate the roads. Access to mobile network data would also help ambulance staff make better decisions, it added.

### **Managing our own health - and that of our loved ones**

Digital technology can also empower patients to manage their own health and care,<sup>25</sup> which is one of the core foundations of NHSX, the unit comprising teams from the Department of Health and Social Care, NHS England and NHS Improvement to drive digital transformation and lead policy, implementation and change.

NHSX Chief Digital Officer Tara Donnelly says: “There is a terrific opportunity here as the provision of personalised care and patient facing digital tools can collectively improve health care experience and outcomes, reduce pressure on the system and provide value for money.”

Digital tools already available include the NHS website,<sup>26</sup> which helps people to understand their condition, be better informed for shared decision-making with their clinician. The NHS App acts as a ‘digital front door’ to the NHS,<sup>27</sup> connecting people to their primary care services. And the NHS Apps Library provides digital tools to help people manage physical and mental health conditions.<sup>28</sup>

But the digital premium offers more than self-care – it’s an invaluable tool in helping us look out for loved ones too. Let’s take frail individuals as an example. In medicine, frailty defines the group of older people who, following a fall, are not resilient enough to recover beyond 80% of their full health. People in this group are at high risk of adverse outcomes requiring long-term care, and of gaining permanent disabilities.

Digital monitoring in their homes enables this growing cohort of frail older people to remain comfortable in their preferred environment for longer rather than being forced into hospital or a care home – in other words, extending their independence.

But it can also provide valuable observations to families, offering valuable reassurance and helping to reduce the worry of the caring burden. In 2018, EDF Energy partnered with tech start-up Howz to offer just such a service, using power consumption data gathered by smart meters to alert carers and relatives when a vulnerable person’s routine.<sup>29</sup> So if a user doesn’t use a kettle at the usual time, for example, the carer receives an early warning that something might be amiss. This enables a speedy response and can reduce the time before receiving care, which can improve health outcomes.

The impact of machine learning on the world of health and social care is already being felt, in areas such as diagnosis, robotic surgery, drug development, and personalised medicines.<sup>30</sup> AI also has the power to monitor and predict the course of epidemics. Artificial neural networks can use data from sources including satellites, social media, and websites to predict everything from malaria outbreaks to severe chronic infectious diseases.<sup>31</sup>

# 4.

## The challenges ahead

Unlocking the myriad of possibilities of the digital premium across the housing, health and care sectors will require visionary leadership. And success will heavily depend on recognising and addressing challenges in three key areas.

The first is the need for greater collaboration at every level, without which the full potential of digital technology to integrate services and improve outcomes can never be realised.

This is arguably the most important of a range of cultural challenges that also include addressing the risk aversion that runs deep within these sectors – rightly so, some would argue. There is also the huge education and communication mountain that must be scaled to ensure successful deployment of any technological change – activities that are so often overlooked or under-resourced.

Finally, there is the regulatory and legislative environment to consider: are our laws and regulators set up to help or hinder the unleashing of the digital premium? Do they even focus on the right things?

### ■ The need for joined-up thinking

It can feel daunting to contemplate the sheer complexity of data integration that is both possible and desirable for the housing, health and social care sectors. But much of the work has already been done; much of the data is already being gathered.

The real challenge is getting to grips with exactly what data to share across and between agencies and how to do that in a General Data Protection Regulation (GDPR)-compliant way.<sup>32</sup> Health data is extremely sensitive, due to its personal nature, and there is understandable anxiety throughout the health and care sectors about getting it wrong and, in particular, about the thorny issue of consent.

Despite these challenges, there are encouraging signs that agencies are recognising the need to work together and finding ways to use digital technology to improve services.

For example, the Social Care Innovation Programme is an initiative jointly funded by the Local Government Association and NHS Digital to explore the potential of digital innovation in social care.<sup>33</sup>

Since 2017, funding has been given to 31 councils to provide digital solutions to social care challenges. Examples include Amazon Alexa being introduced in Hampshire to reduce isolation and enhance independence, Luton and Central Bedfordshire improving the digital maturity of care homes and Norfolk increasing referrals from customer services to appropriate voluntary sector support.

Twelve more councils around the country are currently being funded to develop new ideas to improve social care, seeking innovative uses of digital technology in service design to improve the experience of people using services and to improve service planning and commissioning.

### Fire service frustration

John Black of the Scotland Fire & Rescue Service says his service talks well to the other emergency services at the highest and lowest levels – so the management teams and staff on the ground have good interpersonal connections – but the technology used is basic, and does not maximise the potential of the digital premium. He says: “It’s quite cumbersome at the moment, mainly conducted by email. It would be great to be using technology to share ideas and information about serious incidents more effectively.”

Overly complex bureaucracy is a particular issue in the Scottish fire service, following the merger of eight regional fire services into a single service in 2013. But making use of technology to share data between agencies doesn't have to be complicated. Black cites the example of the current system for alerting social services about vulnerable individuals. He says: "If we're on a call-out and we identify vulnerable adults or children who might benefit from social care, we alert social services.

"At the moment the only way we have of doing this is by sending an email and there's no mechanism to alert us if we've already sent a message about a particular case. So we're repeatedly sending the same information to the same inbox, which is a waste of our time and social services'.

"If there was a common system shared by the emergency and social services that we could log in to, we'd be able to tell straight away if there was an ongoing case and perhaps simply offer an update. It's extremely sensitive information, clearly, so great care would have to be taken to ensure confidentiality but the potential of technology to improve the way we collaborate is huge."

Black says there are other ways that the digital premium could support the fire service. He said: "We have easy access to plenty of information about the dangers of hazardous chemicals but we often come across mixed chemicals at an incident and it's currently hard to find out what the hazardous effects might be of various chemical combinations. We need quicker access to that sort of information."

It's not just within the public sector that closer collaboration can reap benefits. The Fire & Rescue Service has already linked with electric car manufacturer Tesla, for instance. If a Tesla driver is trapped inside their vehicle, Fire & Rescue Service control can contact Tesla directly to obtain a code that will open the doors.<sup>34</sup>

## ■ Should risk be embraced or averted?

There is a fundamental conflict at the heart of the digitisation of public services - particularly health and social care. In her introduction to the Academy of Royal Medical Colleges (AoRMC) report *Artificial Intelligence in Healthcare*, AoRMC Chair Professor Carrie MacEwen, articulated it well when she wrote: "For me, the key theme [...] is the tension between the tech mantra, 'move fast and break things' and the principle enshrined in the Hippocratic Oath, 'First, do no harm.' This apparent dichotomy is one that must be addressed if we are all to truly benefit from AI. What, in other words, must we do to allow the science to flourish while at the same time keeping patients safe?"<sup>35</sup>

This risk dilemma represents a significant cultural block that stands in the way of digital progress across the sectors. And it's one that is already being played out in numerous ways. For example, there are already several health-tech companies making use of AI to create symptom checkers that offer smartphone diagnoses – but the medical establishment has expressed concern that these services cannot yet be relied upon and need better governance to protect patients.<sup>36</sup> So should such symptom checkers be restricted until they can be trusted, or should the health-tech providers be given free rein to develop and promote them further?

### **care.data cautionary tale**

Anyone tempted to play down the significance of risk aversion in digital healthcare would be well advised to remind themselves of the care.data programme, first announced by NHS Digital (then known as the Health and Social Care Information Centre) in 2013.

The programme's aim was to create a central database using patient information from GP surgeries throughout the country. This data would be used in anonymised form by health care researchers, managers and planners both within the NHS and elsewhere, including academic institutions and commercial companies.

care.data was controversial from the outset, with criticism focused on a lack of awareness about the programme in general and in particular about the way patients could opt out of it. In 2014, the programme was stopped for a review by the Cabinet Office Major Projects Authority, which concluded that it had "major issues with project definition, schedule, budget, quality and/or benefits delivery, which at this stage do not appear to be manageable or resolvable."<sup>37</sup> There were two more false starts for the programme before it was finally abandoned in July 2016, at a cost of around £8 million.<sup>38</sup>

## Education and communication

The care.data programme highlights another major cultural factor: the importance of communication and education. Considering the huge potential of artificial intelligence in his report *Preparing the healthcare workforce to deliver the digital future*, Eric Topol said that two of the top enablers across the NHS were the engagement and education of healthcare professionals.<sup>39</sup> The key determinant of whether the NHS successfully uses AI and robotics to transform healthcare, he said, will be the ability of the workforce to harness and realise the potential of AI and robotics.

There are signs that the NHS understands the significance of educating its workforce. In November 2019, the NHS Digital Academy chose its third cohort of 100 digital leaders from across the health and social care system in England to build a generation of leaders who can drive the digital transformation of the service.<sup>40</sup> Moreover, sixteen organisations that provide and commission adult social care services are to receive a share of £4.5m to enable them to roll out their local digital projects on a wider scale through the Social Care Digital Pathfinders grant managed by NHS Digital.<sup>41</sup>

NHS England has also set up a programme to help organisations assess their digital capabilities in terms of how well placed they are to ease the flow of information between the different IT systems of the various health and social care organisations. As part of this programme, NHS England has identified its most digitally advanced organisations, which they call Global Digital Exemplars, and invited them to share their knowledge with other trusts.<sup>42</sup> There's also a Local Health and Care Record Exemplars programme to support the safe and secure sharing of health and care information.

To derive the greatest digital premium across the health and social care sectors, the spirit of these programmes must be adopted by all operators in public and private sectors alike. Conversations should be taking place at board level and between IT teams, and communication within organisations should be clear and supportive of their digital agendas. A number of valuable resources are available to support these aims, including the Going Digital web resource supported by the Housing LIN, ADASS Housing Policy Network, the LGA and other partners; [www.housinglin.org.uk/going-digital](http://www.housinglin.org.uk/going-digital).<sup>43</sup>

There remains a long way to go, however. The impact of this issue on the NHS was summarised well in the Health Foundation report *Untapped potential: Investing in health and care data analytics*, which says: "There is a shortage of people with the right skills and tools to do analysis, and collaborate with clinicians and managers on using their insights to improve care."<sup>44</sup> This is exacerbated when the analysts we do have spend much of their time doing relatively low-value work – for example, compiling reports that aren't read. By investing in the analytical workforce, we will be able to unlock the full potential of data."

## Regulatory and legislative hurdles

The digital world is a complex environment for regulators and law-makers – a glance at the flurry of activities around the formulation and implementation changing GDPR regulations between 2016 and 2018 is all that's needed to confirm that.

But most, if not all, of the laws and regulations needed to safeguard the public and ensure proper rigour among health and social care operators already exist. For regulators, the key is to practically ground regulations by being crystal clear about their ultimate purpose and then to build them into Key Performance Indicators.

This focus on the ultimate purpose as a lodestar through the difficult regulatory waters is equally important for health and social care leaders working on their digital strategies.

Starting with the desired outcomes in mind and maintaining a clear view of those outcomes throughout the long and complex journey is absolutely key.

### How does regulation keep up with innovation?

In September 2018, the Department of Health published a code of conduct covering data-driven health and care technology.<sup>45</sup> Acknowledging the remarkable potential of technological advance, data-driven innovation and new techniques that make use of artificial intelligence, the authors of the code also noted that innovators in digital technology might not be familiar with the levels of regulatory and ethical rigour that apply in the realm of public health.

The code says: "It is our duty as NHS England and central government to capitalise on these opportunities responsibly. If we do not think about issues such as transparency, accountability, liability, explicability, fairness, justice and bias, it is also possible that the increasing use of data-driven technologies, including AI, within the health and care system could cause unintended harm."

To address these concerns, the code sets out ten principles designed 'to enable the development and adoption of safe, ethical and effective data-driven health and care technologies'. These principles cover everything from understanding the needs of users of new technology, making use of open standards to enable interoperability, and being transparent about the limitations of the data used, to making security integral to system design.

It's a frank acknowledgement of an issue that will concern a growing number of people as the importance of digital technology grows in health and social care.

### Shifting regulatory focus

There's a cultural adjustment to make in the way we approach public service regulation too. Historically, regulations across all sectors have focused on organisations and markets more than systems and infrastructure. This reflects the importance of maintaining the highest possible levels of service and ensuring tight financial scrutiny of public money. But the sector's growing reliance on systems and infrastructure means they must be regulated with equal rigour or opportunities will inevitably be missed.

The UK House of Lords explored this fast-moving regulatory environment in a report published in early 2019. Regulating in a digital world concluded that digital technology does not merely require more regulation but a different approach to regulation.<sup>46</sup>

It proposed a set of ten principles to frame all digital regulation and a new Digital Authority to oversee it, with access to the highest level of the Government. The ten principles are:

1. **Parity:** the same level of protection must be provided online as offline
2. **Accountability:** processes must be in place to ensure individuals and organisations are held to account for their actions and policies
3. **Transparency:** powerful businesses and organisations operating in the digital world must be open to scrutiny
4. **Openness:** the internet must remain open to innovation and competition
5. **Privacy:** to protect the privacy of individuals
6. **Ethical design:** services must act in the interests of users and society
7. **Recognition of childhood:** to protect the most vulnerable users of the internet
8. **Respect for human rights and equality:** to safeguard the freedoms of expression and information online
9. **Education and awareness-raising:** to enable people to navigate the digital world safely
10. **Democratic accountability, proportionality and evidence-based approach.**

## **Data ownership: don't overcomplicate it**

The rules governing consent from the people whose data is being used are also profoundly important, particularly in the health and care sector. It is crucial that people are fully informed about what they are consenting to. Before patient records were computerised, all that was needed to protect them was to lock the door of the room in which they were stored; not any more.

The key is to be proactive. Data sharing is always going to be difficult but retrofitting data sharing into existing systems will always be harder than building it into new ones. Board members must embrace the challenge, think ahead and not be held back by fear of getting things wrong. Ultimately, the law exists to protect the citizen, not to restrict care providers.

For Raoul Pinnell at Bromley Healthcare, data ownership is an issue that could be solved. He says: "There's far too much talk in the public sector about ownership and access to patient records. Should these records be owned by the hospital, the GP clinic, or the local authority, perhaps and who should be allowed to share them? It seems obvious that patients should own their own records and this might make people more aware and responsible for their own health. In addition, when a record is created or updated should we not move to 'presumed consent' that health and social care professionals, working in a person's best interest, are able to have access to them?"

"Common sense should prevail in this area – the barriers we currently have in place are unhelpful and nonsensical. They add to cost and complexity and might get in the way of improving the quality of care."

## **Regulating the network**

Of course, every breakthrough in digital technology we've explored in this report depends on a fast and reliable broadband network and infrastructure. We've never depended more on that network and this dependence will only grow as technology advances. Progressive and enlightened regulation is as important a factor in ensuring the long-term health and robustness of the network as any technological development.

When Ofcom was first established in 2003, the regulator was focused primarily on opening up BT's network so that other operators could rent lines at cost and create a more open market. Then, after much lobbying, the focus has now switched to encouraging investment in separate, competing next generation networks which can deliver greater benefits to consumers according to David Christie from Virgin Media's regulatory and public affairs team.

Christie has a positive view of this change. He says: "It could easily have become a race to the bottom on price but the regulator recognised that it was more important to find ways to encourage operators to invest in the infrastructure. High quality networks benefit everyone more than a price war. So rather than just renting BT's lines, other operators can now invest in their own networks to deliver their own services directly to customers – and that serves to encourage involvement, investment and innovation."

An ultrafast modern network requires significant commitments from operators and they are understandably keen to receive all the reassurance they can get that this will be a worthwhile investment. So Ofcom's long-term perspective is welcome.

But there's still room for improvement. Christie says: "We're speaking to the government about making it easier for operators to get access to land to build the network and we've done a lot of work with local authorities to ensure that broadband connectivity is on their radar. There are also regulations controlled by central government covering land access; we understand that landowners and legislators are sometimes concerned about allowing access to land and we're keen to reassure them that we always try to operate fairly and sensitively."

"Ultimately, our message is that this ultrafast broadband initiative has the potential not only to transform healthcare but also to change the way we work, to improve social interaction and even to help fight climate change.<sup>47</sup> It's in the national interest that we find ways to roll it out smoothly and well."

## Evolving infrastructure

Society's growing dependence on digital technology requires infrastructure that is robust and fast enough to meet the challenge. As the role of technology grows in the health and social care sectors, so does the importance of that technology being reliable – and that is entirely dependent on the network it runs on.

It's worth taking a moment to reflect on just how rapidly the UK has adopted internet technology. In 1999, 9% of households had access to the internet; just two decades later that figure is now 93%.<sup>48</sup> And the infrastructure that provides that access has changed beyond recognition, from a copper-wired analogue network to one based on digital signals travelling through fibre optic cables.

The UK's move away from its traditional public switched telephone network (PSTN) to a network-based purely on internet-based telephony will be complete in just a few years. BT is working towards all of its customers using internet telephony (called voice over internet protocol – or VoIP) by 2025 and other providers will migrate even sooner.

For most people, the impact of this change – which is happening all over the world, not just the UK – will be minimal. Mobile telephony has become more important than fixed line calls to UK consumers and in any case most modern phones work perfectly for VoIP calls.

But the change has significant implications for some sectors. In the world of tele, for example, devices such as some older plug-and-play home care alarms are only designed to work with the old PSTN technology. The TEC Services Association (TSA), which is the representative body for technology enabled care (TEC) services, estimates that around 1.7 million people who might otherwise require a number of home care services or a place in a care home rely on these sorts of devices to maintain their independence.<sup>49</sup>

Another issue is that PSTN-based devices are powered directly from the telephone exchange, so they don't need a mains supply to work (that's why it's possible to use a landline during a power cut) but VoIP technology uses a broadband connection, which does require mains power. So if there's a power cut, the phone line also dies.

Network providers are working hard to ensure their customers are aware of the change and understand what they need to do to be ready for it.

One provider, Virgin Media, is looking to make its network gigabit capable by the end of 2021. That means the entire Virgin Media network – currently serving around 15 million homes – will have access to an average peak-time download speed of 1,104 megabits per second (Mbps). To put that into perspective, the average download speed across the country in 2019 was just over 22 Mbps.<sup>50</sup>

This hyper-fast broadband, which has already been rolled out in Reading, Southampton and Manchester, should unlock significant benefits. In one recent trial, Virgin Media rolled out a service for stroke treatment in the North West, allowing out-of-hours remote diagnosis over a high-speed corporate ethernet network by a relatively small number of specialists. This led to quicker access to treatment and better outcomes for patients. A gigabit broadband network would mean this could be replicated in people's homes.

# 5.

## Prompts for Board members

From the national government to the board of the smallest housing association, leaders across the housing, health and social care sectors and the emergency services need to engage in conversation about how they can unleash the digital premium in their realm. It is no longer sufficient for those conversations to be taking place within a single department; the possibilities cross all sectors and all functions so your teams will have to work together, maybe more closely than ever before.

Just as important as the discussions about what digital technology can do to help you is the question of how you can improve your outlook, your culture and your structure to fully exploit the potential that digital technology has to transform the way you run your services.

Recognising that boards operate within highly complex environments, and that digital innovation is an area of potential further complexity, boards should always bring their discussions back to their central purpose. The starting point should always be what you are trying to achieve as a board rather than looking at what currently exists, or how existing structures operate.

Keeping people safe and comfortable at home for longer and improving health outcomes through greater prevention, independence and community wellbeing is a noble cause and a powerful focus for boards throughout the public sector.

**These five board prompt questions are intended to provoke thought in order to support the digital strategic direction of your organisation.**

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1. What efforts is your Board making to embrace the transformative potential of digital technology within health and care?
  2. How are your stakeholders being engaged as part of developing and delivering this digital strategy?
  3. What expert advice and information does your Board have access to in relation to digital?
  4. What data do you collect, and what data should you be sharing with others?
  5. In what ways is your Board collaborating with others from across a range of sectors in order to achieve the best outcomes for the communities you serve?

We encourage you to reflect on these questions and discuss them with colleagues. Further prompts are included below to aid productive discussion in relation to unleashing the digital premium.

- See the digital premium as an opportunity to be embraced, and not a threat to be avoided – Boards should embrace risk within established assurance frameworks.
- Be proactive where possible – digital transformation is a live and dynamic issue, and retrofitting is always harder and less effective than building it into systems from the outset.
- Value the importance of inter-agency collaborations, and start the conversation – building relationships, openness, and removing boundaries can be powerful forces for change.
- Reflect on the need for education and communication - consider how you do this for yourself, your staff and your service users
- Improve your awareness of the potential of the digital premium to help the communities you serve – and put plans in place to reap the benefits
- Reflect on the digital position of your organisation and define a clear digital strategy
- Set your sights internationally, not just nationally – there are lots of places to take practical inspiration from.
- Don't simply replace current systems with digital add-ons. There are lots of opportunities to improve and redefine services with appropriate digital support.



# 6.

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# 7.

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