DIGITAL JERSEY

Digital Strategy

Health and Care in Jersey

Contents

1. Executive Summary

This digital strategy for health and care set out the broad ambitions and approach to 'digitising' the whole health and care system so that the benefits of digital technologies can in turn deliver benefits to patients, service-users and care professionals alike. The broad vision is:

"Jersey is a 'digitally-world-class' health and care system that uses technology everywhere to deliver accessible, joined-up, person-centred care that is safe, effective and efficient, where data is used intelligently to improve every aspect of care, and where innovation flourishes."

In order to achieve this vision, Jersey will put in place a number of key technical and operational components over the next 5-10 years:

- Ensuring that each part of the health and care has a core patient / service-user records-keeping and administration system in place, which meets basic 'maturity' levels and supports 'open standards.'
- Implementing a universal identifier for all persons, based around the "People Directory", and integrating that into electronic systems, interfaces and interchanges between all parts of the health and care landscape
- Implementing a Jersey Care Record; a universal online record of individuals interactions with health and care organisations, and a 'hub' for implementing cross-sector 'business logic' such as 'safety alerting', all accessible through a single public-facing portal
- Creating electronic care plans, closely coupled with Jersey Care Record, so that all care professionals, and patients/service-users have access to that information, wherever they are
- Supporting pathways of care, in combination with online digital care records, electronic care plans, and intelligent use of data to monitor compliance
- Facilitating much more effective care professional to care professional communication with technology
- Creating a repository of health and care data, and using a combination of human and machine driven analysis, improve how care is planned, delivered and managed.
- Developing the digital competence of care professionals and islanders, so that they can exploit digital technologies effectively
- Create an infrastructure and environment that promotes health and care research, development and innovation

Delivering these important components will require high level sponsorship and coordination across many projects and activities, so strong leadership from HSSD will be required to drive implementation and oversee the cumulative delivery of benefits across the sector for all parties.

Key measures of success include the creation of the Jersey Care Record, and its active use in health and care interactions by 2025, with an online-portal for all patients / service-users to access their records, and an increasing number of services accessible through this gateway. In all there are 31 individual commitments in this strategy, all designed to achieve digitally world-class health and care services by 2025.

To resource this programme of work we will look to utilise existing budgets, and work to ensure that each successive project is aligned with the overall roadmap, so that there is a cumulative beneficial effect from each individual project.

This strategy looks to a fixed period of time, building on work to date and existing plans; the vision set out in this strategy is intended to have a longer life, remaining pertinent into the future beyond this strategy as new technologies, treatments and models of care develop.

2. Background and Introduction

2.1 The Changing Shape of Health and Care in Jersey

In late 2012 the States of Jersey agreed an overarching strategy for responding to these demands with a strategy to reshape services; A New Way Forward (Sep 2012)[1]. That strategy identified fundamental changes to deliver a "Safe", "Sustainable" and "Affordable" system for the future, and since then there has been much further work to define the specifics of how each part of the new system will operate, for example Sustainable Primary Care (2015)[2], Mental Health Strategy (2015)[3], Acute Services Strategy (2016)[4], amongst others, and

1 https://www.gov.je/Government/eGovernment/Pages/AboutEgovernment.aspx
2 https://www.gov.je/Government/Pages/StatesReports.aspx?ReportID=1782
3 https://www.gov.je/Government/Pages/StatesReports.aspx?ReportID=1710
4 http://www.gov.je/government/pages/statesreports.aspx?reportid=2216

work to implement these strategies has already started in earnest, with some changes already evident.

Collectively these strategies set out the vision and plans for how health and care will being reshaped over the coming years, to the benefit of patients, service-users and the economics of the sector as a whole. Technology is seen as critical enabler in all of these strategies and plans; without effective technology the anticipated benefits are unlikely to be fully realised. Primary and secondary care organisations have recognised this and developed strategies and plans to enable these developments. This strategy consolidates and builds on these existing plans, setting out a system wide vision and strategy for how technology will be used to integrate care and deliver better services for the citizens of Jersey. This strategy aims to ensure that service transformation is enabled and that technology solutions implemented 'think ahead' sufficiently in a way that can readily accommodate future innovations.

2.2 'Tech' Explosion

Digital technology has been one of the biggest enablers of change in other sectors such as banking, retail and travel; at first driven by the internet with many services shifting to online business models (Amazon first launched in 1995), and then latterly, by the explosion in mobile device technology. Astonishingly, it is only nine years since the first iPhone was launched, unleashing a world of "Apps" that many of us rely upon daily, and as a result of an exponential growth in this area we are all now more 'App enabled' and 'digitally connected' than ever before, for example:

- Number of apps in Apple Store: 2 billion (June 2016 figures)[5]
- GooglePlay: 2.2 billion apps (June 2016 figures)[6]
- Facebook: 1.18 billion daily active users on average (Sept 2016 figures), of which 1.09 billion are active 'mobile' users
- WhatsApp users: 1 billion (February 2016)[7]
- Mobile banking transactions daily (UK): 10.5million (via Apps), versus 9.6million (internet) (as at June 2015)[8]

Despite phenomenal growth of the number of Apps and online services, the health and care sector has not yet embraced digital technology to anything

5 https://www.statista.com/statistics/276623/number-of-apps-available-in-leading-app-stores/
6 http://newsroom.fb.com/company-info/
7 https://www.statista.com/statistics/260819/number-of-monthly-active-whatsapp-users/
8 http://www.telegraph.co.uk/finance/newsbysector/banksandfinance/11672021/Mobile-banking-has-eclipsed-branches-and-even-the-rest-of-the-internet.html

like the same scale as other sectors; studies by PwC, Deloitte, BCC Research et al, conservatively estimate that of the 2.2bn apps on Apple's AppStore, only 165,000 are related to health, with only a tiny percentage of those actually used in practice[9]. To some degree this is understandable as Apps tend to be orientated towards the consumer, whereas health and care services currently concentrate on technologies orientated around the care professional (Doctor, Nurse, Social Worker, Paramedic etc), for example EMIS primary care system, or TrakCare in secondary care. This strategy seeks to find a balance which enables both care professionals and 'consumers' to take advantage of technology to improve health and wellbeing for all.

The challenges the sector now faces in terms of increasing demands and spiralling costs could be the 'call-to-action' that is needed to focus efforts on digital technology to bring benefits to the sector; a McKinsey & Co report for the NHS National Information Board in 2014 estimated that digitally enabling processes in the NHS could liberate between £8.3bn and £13bn in savings[10]. McKinsey's evidence identifies a number of key enablers such as: integrated care, electronic health records, prevention/early intervention, e-rostering and scheduling, self-care, remote monitoring, mobile working etc, which together underpin the projected savings. Whilst Jersey is obviously not at the same scale as the NHS, the identified enablers remain very relevant to the reshaping of health and care on the Island, and the MTFP sets out savings required from HSSD, which this programme is expected to contribute towards.

We are also conscious that advancements in 'functional' technologies, such as those which, say, allow us to book an air ticket, check our bank balance, or order groceries, are only the 'tip of the technology iceberg'; there are huge advancements in the field of data-driven / intelligence-driven services which appear in the press increasingly frequently. One of the most recognisable of these companies is IBM whose "Watson" cognitive computing platform uses 'Artificial Intelligence'[11] to create insight from huge quantities of data to solve complex health and care problems, for example identifying disease prevalence patterns in populations, or supporting care professionals to make better decisions[12].

The impact of cognitive computing is expected to be significant; in a very short space of time this field of computing has developed to the point where is it already starting to tackle real-world problems.[13] Whilst we recognise

9 https://www.ft.com/content/ed3268f2-e620-11e5-a09b-1f8b0d268c39
10 http://www.digitalhealth.net/includes/images/news0254/PDF/overview-evidence-review-of-data-and-information.pdf (Page 9, £13bn overall total savings estimate)
11 https://en.wikipedia.org/wiki/Artificial_intelligence
12 https://www.ibm.com/watson/health
13 https://mihin.org/wp-content/uploads/2015/06/The-Impact-of-Cognitive-Computing-on-Healthcare-Final-Version-for-Handout.pdf

that there are many foundational digital technologies that Jersey must put in place to support the much needed health and care service transformation, the potential advances that cognitive computing could bring to the sector in the lifetime of this strategy, make a strong case for including it in from the outset so that Jersey is able to capitalise on that potential at an appropriate point.

2.3 Jersey 'Tech' Footprint

For an island of circa 100,000 people and an area of 45 square miles, Jersey has a high 'tech' uptake amongst its citizens, schools and businesses. Estimates by Digital Jersey in 2015 indicate:

- 118 mobile subscriptions per 100 inhabitants
- 87% broadband penetration per 100 households
- Three 4G networks covering the island
- All schools and 22,000 properties connected to 'fibre' networks
- In the Top Ten for download speeds on Ookla global comparisons

It seems that Jersey is more than ready in terms of technology infrastructure, but now needs to find ways to capitalise on that advantageous position in the context of health and care; this strategy hopes to set out the steps that now need to be taken to put health and care digital technology on a strong footing for the benefit of all citizens.

2.4 Digitising Government

The States of Jersey is in the midst of a substantial programme of work to transform how government interacts with its citizens, through its "eGov" initiative which aims to: i.) improve customer service by making the States easy to do business with, ii.) reduce the cost and time of delivering services, iii.) create services that are built around customers and delivered in a secure, robust and efficient way, iv.) improve information management and data sharing, v.) stimulate local digital industry.

It is anticipated that this programme will eventually cover all services that are delivered, commissioned or managed by the State, including health and social care, as the largest and most complex area of State responsibility. This Digital Health and Care Strategy builds upon the foundations of the eGov strategy,[14]

14 https://www.gov.je/Government/eGovernment/Pages/AboutEgovernment.aspx

providing specific direction for the approach to digitising health and care services, and ensures alignment with eGov's key components, for example the single customer portal, and "Tell us Once' service.

2.5 Digital Economy

Digital Jersey was founded in 2012 to promote digital innovation with the broad aim of making Jersey an internationally recognised centre for digital industries, and to foster economic growth and prosperity in the digital sector.

At the end of 2015, Digital Jersey identified Digital Health as one of its key strategic priorities following a KPMG process of market research and alignment[15]. During 2016, in collaboration with Jersey Health and Social Services Department (HSSD) and industry, Digital Jersey focused on the health and care sector to help stimulate 'digital thinking' and support the transformational changes being undertaken as part of "A New Way Forward". A series of workshops were convened bringing the various parts of the health economy together to drive collaboration and innovation with a view to creating some tangible technological solutions to real-world problems.
Whilst those activities were productive in their own right, it quickly became clear that a coordinated approach was needed to ensure investment in digital technologies properly supported the Island's broader health and care improvement and integration aspirations.

Recognising this situation, the stakeholders involved in the Digital Jersey Steering Group agreed that the Island would benefit from a comprehensive Digital Health and Care Strategy, to 'join-the-dots' between the various initiatives and strategies currently underway (or being planned) and provide a clear overarching narrative for how digital technologies and services will be used to help achieve the broad ambitions for better health and care for the citizens of Jersey, and the growth of a digital health tech sector.

This document is that Digital Health and Care Strategy, and is the culmination of a range of background research, stakeholder interviews and sector discussions over the last few months (see Annexe IV for stakeholders list).

15 http://www.digital.je/media/Public_Files/DJLKPMGReport2016.pdf

3. A Digital Health and Care Strategy for Jersey

3.1 What's the Scope of the Strategy?

This strategy is intended to cover all users of health and care services by Jersey citizens (and visitors to Jersey), irrespective of whether those services are paid for by the State, individuals, or some combination of both, and which may be delivered on-Island, or indeed off-Island through one of the many partnerships in the UK. This strategy is also designed to address all parts of the sector, wherever health and care is provided, and is therefore inclusive of services in primary, secondary, community, mental health, childrens services, social services, prison, voluntary and community sector, nursing and other private / independent agencies/organisations, so that there is a view of the digital needs of the 'whole system', rather than focusing on smaller sub-sets which could skew efforts / investment.

3.2 Term and Terminology

Digital: Throughout this document we will continually use the word 'digital' to refer to any electronic means of capturing, viewing, storing or transacting data to perform some useful task for us either as individuals, as part of a business / service / function, or indeed at an organisational level. Digital services can take many forms, ranging from dedicated computer systems (eg EMIS, TrakCare), general software applications (eg Word, Excel), websites (eg www.gov.je, www.jod.je, www.nhs.uk), Apps (eg Big White Wall, SleepCycle, BNF, Instant Heart Rate Monitor) or data / information resources (eg www.data.gov.uk, www.oecd.org, www.google.co.uk), or any combinations of those.

Service-User: It is difficult to find a term that refers sufficiently well to the different users of services throughout the health and care landscape, as the context determines the most relevant phrase at any moment in time. So, for example "patient" is relevant in the context of health interventions, whereas "client" is an oft used term in adult social care, and "citizens" is a general term for Island residents. For the sake of simplicity throughout this document we will use the term 'Service-User(s)' whenever we are speaking generically, and will use specific terms when the context is also specific; in every case though what we mean is a person / individual who needs or is accessing services in some way.

Health and Care Professionals: We use the broad term to refer to the professionally trained people who work in the health and care system including, for example, Doctors, Nurses, GPs, Physiotherapists, Social Workers, Paramedics, Psychologists, Care Assistants etc.

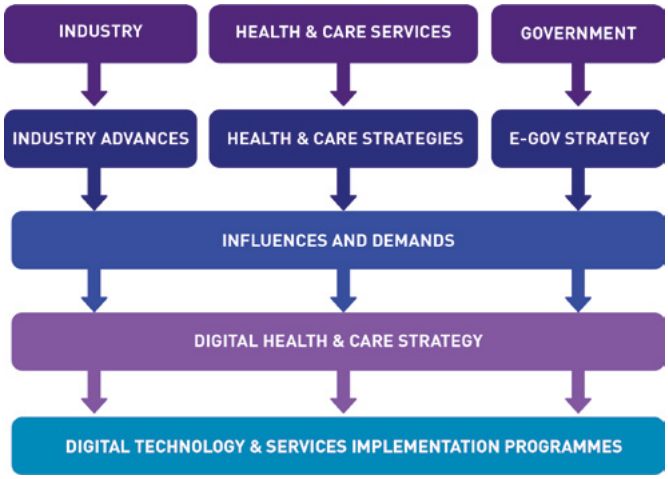
3.3 How Does this Strategy Fit-in?

This strategy 'joins-the-dots' between the existing individual business strategies e.g.Sustainable Primary Care, Mental Health, Acute Services, and technology / delivery strategies such as Health and Social Services Informatics Strategy, and links those to the eGov developments such as Tell us Once, and Single Customer Portal. This strategy also takes on board the potential of emerging technologies, and considers how those can be included in the overall vision for the future of digital health and care in Jersey.

The development of this strategy has been influenced by technology considerations related to the future new hospital and the early technology plans for the future new hospital has been equally informed by this strategy.

As health and care is such a complex business area, a single digital strategy describing how digital technologies will support and enable health and care to be delivered more effectively, in an integrated, cost efficient manner is helpful to guide and shape all subsequent technology delivery programmes, and act as a 'touchstone' during the long periods of delivery that are necessary to complete the journey.

Our aim is to provide a simple, strong narrative that helps everyone understand what we are going to put in place in Jersey to make sure technology helps deliver 'safe, sustainable and affordable care' for all Islanders now and into the future.



We have tried to be 'specific enough' in this strategy to provide an unambiguous level detail for those charged with subsequently implementing the plans set out in this document. However, as with any strategy, it is impossible to specify absolutely everything at this early stage, so further detailed architectural and process design work will need to be undertaken, with regular design review and delivery check-points to ensure that the desired direction continues to be followed during the life-cycle of development.

3.4 Sustainability

As we were undertaking the discovery and research work to develop this strategy it became clear that whilst Jersey has many helpful characteristics, for example accessibility of government, regulators / care professionals, freedom to decide what's best locally, and an innovative and business-minded culture, which should in theory make it easier to get things done, it also has many of the less desirable characteristics of other countries, for example fragmentation of services, different funding streams / reimbursement models, system supplier difficulties, and of course access to relevant and capable skills / resources.

Being an island economy is therefore a major factor in thinking about longer term sustainability of any solutions which might be implemented to solve the health and care transformation challenges; in fact, much more so than if this were an implementation on the mainland. It is easy to see how and why some of these less desirable characteristics have affected projects which are essential to delivering integrated services, for example, long gestation of the hospital Electronic Patient Record, and subsequent integration between primary and secondary care of laboratory results requesting/reporting.

This strategy therefore attempts to address this sustainability problem, to mitigate some of the less desirable characteristics, and concentrate efforts on exploiting and magnifying those positive characteristics such as innovation.

3.5 Drivers, Influences and Constraints

The research and background work with stakeholders in the lead-in to this strategy has drawn out a number of Drivers, Influences and Constraints that affect the shape of the overall strategy. Those key factors are summarised below:

Macro-Level Drivers of Change

- **Money:** challenging financial envelope, as costs of services continue to grow beyond the income / tax receipts potential for the Island
- **Workforce**: a greater proportion of the Islands care professionals are closer to retirement age than ever before, and Jersey will need to address any shortfalls in coming years
- **Demand**: a sustained increase in the demand on services, in part due to an increasingly aged population, and growth in conditions such as diabetes is putting pressure on existing capacity, and which will be exceeded in the next few years
- **Expectations**: patients and the public expectations of the health and care system continue to grow as advances in medical treatments and interventions enable more of us to be cured and live longer for a wider variety of conditions
- **Outcomes**: improving care outcomes for all users of health and care services, to maintain current levels, and work towards exceeding the best international comparisons
- **Prevention**: increasing efforts on preventative measures significantly reduces the costs of providing healthcare for a population; interventions such as smoking cessation, and weight management have massively beneficial effects for patients and the sector as a whole

Operational / Transformation Drivers

- **New Models of Care:** more care delivered in out-of-hospital settings, in the community, closer to the patient's home, is better for patients and reduces demand/pressure on hospital capacity. Alternative ways of delivering certain forms of care, such as electronically, or self-directed have a significant part to play in reshaping health and care services in Jersey
- **Efficiency**: delivering care in ways that are more efficient and cost effective than traditional means, for example coordinating bookings to avoid wasted appointments, or providing richer information for professional decision making at the point of care, to reduce the need for subsequent attendances
- **Personalisation**: the increasing focus on the individual, and the way in which they wish to interact with services in other sectors creates a pressure on health and care services to think more about how its services are configured more effectively around the individual

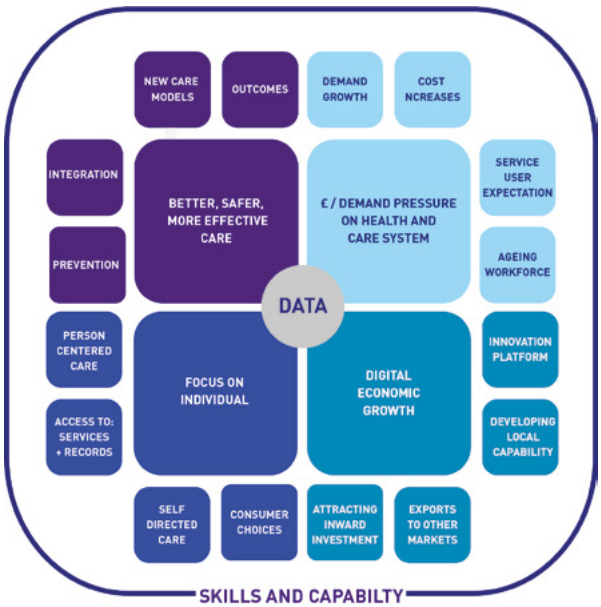
Other Factors Influencing the Strategy

- **Sustainability**: ensuring that technological solutions implemented in Jersey are capable of being sustained on a longer term basis is a significant influence on the choice of digital solutions, and the development of a local capability an important aspect of sustainability
- **International Standards:** existing and emerging international and increasingly 'open' standards in health and care sectors, if adopted in Jersey, could increase the potential for integrated care, and reduce costs of developing solutions configured specifically for Jersey
- **Technology Trends:** emergence of sophisticated cognitive / data technologies presents some unique opportunities for Jersey's 'walled garden' if sufficient data can be captured from health and care systems. Capitalising on growth in mobile, connected technologies such as 'wearables' and the Internet of Things (IoT) offers potential for increasingly personalised health and care services, and a much richer seam of data for care professionals to inform their judgements
- **Growth of Digital:** Jersey wishes to expand the economic potential of the digital health and care sector, by leveraging investments in core systems / supporting technologies, to generate income for the Island and becomes an international exemplar

Constraints Which Could Limit / Affect

- **Skills & Capability:** access to the necessary skills and capabilities required to deliver this strategy, and the wider set of systems and services implied / caused by it, is a serious constraint to successful delivery. We need to find mechanisms to ensure that skills can be acquired when needed, and that they continue to be available throughout the duration of delivery. We also need to ensure that the health and care workforce is suitably equipped to use and exploit digital solutions in their daily work – it cannot be assumed that care professionals will simply 'pick it up' as they go

We've summarised these in the following graphic for simplicity:



3.6 Vision and Ambition

The work with stakeholders to determine the key influences, drivers and constraints also sought to identify the specific ambitions and vision for health and care, and to do this from different service-user and stakeholder perspectives to ensure that the strategy is inclusive of all parts of the health and care system equitably. The resulting detail is set out in the document included at Annexe II - Vision, Ambition, Principles, from which we draw the broad objectives of this strategy which are to:

- Use digital technology to improve the way in which services are designed, delivered, and managed in an integrated way, with a clear focus on the individual and their experience, and where health and care professionals can make the best decisions they can because they have the information they need at the point of care / decision
- Exploit the potential of health and care digital data to create relevant, actionable intelligence which is used routinely to improve patient safety, deliver better outcomes, and focus limited resources in the right places/at the right time, for the benefit of individuals and the sector as a whole
- Develop a thriving digital health and care economy as a direct consequence of using digital technologies successfully throughout the health and care sector, drawing investment, supporting research and innovation, developing skills and capabilities, and to be seen internationally as an exemplar of 'digitisation'

The overall vision is for a 'digitally enabled' and 'inter-connected' health and care system where:

- digital records are the dominant form of record used across the health and care system, systematically removing paper-based processes from every part of the landscape where it is appropriate to do so
- patients, clients and service-users can easily find information about the services on offer, and locate relevant information about conditions, treatments and interventions which is trustworthy
- individuals are able to book and manage appointments / consultations with health and care services and/or care professionals digitally, without needing to contact / attend those services during 'opening hours', and to do this from wherever they are, from any smart electronic device
- individuals can view and contribute to their own records, and can see who else has accessed their information at any time, wherever they are, and on any device
- care professionals have access to content-rich person-event-records, wherever they are, at any time of day, and on any device
- patients and service-users can take more control over aspects of their care, consuming services in different ways, and in combinations that are relevant to the individual, and not bound by the physical location of the service or care professional, or the time of day
- care is coordinated seamlessly between different organisations, care professionals and services, such that any individual's care journey is a continuous, unbroken sequence of events, with each step of that journey enabled digitally
- patients and service-users are freed from the necessity of physical presence, where digital communications, online, or mobile enabled services could replace them, for example, ordering repeat prescriptions
- health and care professionals, patients and service-users are able to communicate with each other digitally, and are able to exchange confidential information safe in the knowledge that this information is secure
- data is used routinely by care professionals, specialists and system leaders to derive intelligent-insights which positively influence the decisions they take on a day-to-day basis, for example to improve the safety of medicine administration, or prompting / alerting a doctor when an at-risk patient is admitted to hospital
- care professionals, industry and academia want to work in/with Jersey

because it is one of the best examples of an effective digitised health and care system in the world

- innovators, both from within the health and care system, and external to it, are able to develop new services / models-of-care / products that can be easily integrated into the landscape, subject to necessary approval
- health and care professionals have the necessary skills to use and exploit digital technologies and data in their daily lives

If we achieve these Jersey will become a world-class, digitally integrated health and care system, on a comparable footing with the most advanced systems in Denmark, Estonia, Sweden, and Finland.[16]

It has taken many years for those countries to develop their digitally integrated health and care systems, so we should not underestimate the challenges facing Jersey. However, it is a journey that brings with it valuable benefits to patients[17], the public, care professionals[18] and the sector as a whole. Jersey has already started this journey, but there is much coordination and alignment to be done, to ensure that:

"Jersey is a 'digitally-world-class' health and care system that uses technology everywhere to deliver accessible, joined-up, person-centred care that is safe, effective and efficient, where data is used intelligently to improve every aspect of care, and where innovation flourishes"

In the following sections we describe what needs to be done to help Jersey achieve a truly 'digitally-world-class' health and care system.

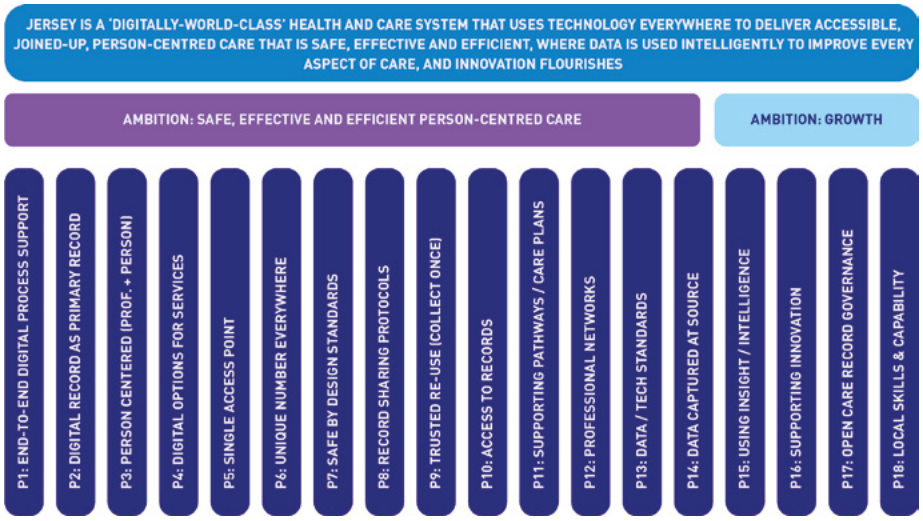
16 EC-OECD workshop "benchmarking ICT in health systems", Brussels, April 2013

17 "Interoperable eHealth is Worth it?", EC Study Report, 2010

18 https://www.ehealthontario.on.ca/images/uploads/annual_reports/Benefits_Realization_Update-en.pdf

3.7 Design Principles

The vision and ambitions outlined above generated a set of key design principles which both helpful in shaping this strategy, and which will act as a 'touchstone' for the subsequent programmes of work that will be necessary to deliver a 'digitally-world-class' health and care system in Jersey. The principles are documented in detail in Annexe II - Vision, Ambition, Principles, and are illustrated graphically below:



These digital health and care principles build upon and align with the nine principles established in the eGov programme. Our aim in specifying 18 mandatory principles is to be sufficiently specific and unambiguous, so that we provide a very strong steer to all subsequent programme design and delivery work that results from this digital strategy.

4 Digitising Health and Care Services

4.1 Digital Records are the Foundation

It is hard to imagine how the potential of digitisation[19][20] can be achieved in a health and care system that continues to use paper records for its core operational processes; digital records are the foundation of inter-connected services in other sectors such as banking, insurance, retail, travel, and yet

19 http://www.digitalhealth.gov.au/get-started-with-digital-health/benefits
20 https://nuffieldtrust.squarespace.com/digital-technology

the health and care care sector remains rooted in paper-based processes and records.

Structured digital person-based records enable information to be easily moved, sent, uploaded, downloaded, shared, exported / imported, and renders physical 'record stores' irrelevant. They are a critical foundation upon which other digital services and process can be implemented, so the promotion of "digital records everywhere" has to be one of our key priorities in this strategy.

Commitment 1: This strategy requires every significant part of the health and care system to implement electronic record systems that are capable of capturing and sharing structured information electronically with other parts of the health and care system (incrementally, to be comprehensive by end of 2019)

However, we can't just digitise everything at the same time; there simply aren't enough resources to be able to do this concurrently, so we have to take a much more considered approach, based on the volume of activity, the level of risk that an absence of such records might create, and the likely benefits to that business area, or the sector as a whole from digitising that part. Such an approach would tend to suggest that primary care, and secondary care (including all of the services operated from secondary care such as mental health, children etc), and hospital and community pharmacy, as the principal targets for full digitisation.

Fortunately, we are not starting from scratch, significant efforts in the last few years have meant that primary care is now heavily digitised, and significant parts of secondary care are on their way to being digital. Very recent implementations of EMIS in both Family Nursing and Home Care (FNHC) and Hospice also mean that records are now being kept in structured digital form in most parts of the health system. And in the social care arena, there are also digital record systems covering adult social care and, shortly, children's care too.

So where are the gaps? Well there are notable gaps in services such as Ambulance, where there are no real patient record systems of note, and in community pharmacy, where systems are predominantly dispensing / stock management, rather than detailed person-records.

Although filling the gaps by, say, implementing a patient information system / electronic health record in the ambulance service is important, we also have to make sure that the data which those systems capture is consistent with the way in which similar information is held in other systems, for example using common person identifiers such as JY Number, or address details, or specific

codified information such as clinical details e.g.SNOMED[21] or ICD10[22]. Jersey needs to adopt a common 'dictionary' across all of its key systems to ensure that it is possible to translate data from one system to another in a consistent manner, so that the maximum benefit can be achieved from digitisation

Commitment 2: To ensure that all digital records are consistent with a common standard, Jersey will create a common record architecture and data dictionary which will be applied in all system implementations, and integration activities (by December 2017)

Rather than invent these from scratch, Jersey should adopt existing records and dictionary standards from elsewhere, the most obvious candidate being the NHS in England, where significant work has been done on record architectures (eg Clinical Document Architecture, OpenEHR) and national data dictionaries and models[23].

The second major concern with simply filling the gaps with off-the-shelf systems is in ensuring that those systems carry sufficient functionality to work with those records in a meaningful way. Obamacare in the USA defined a series of helpful levels of "meaningful use"[24] that electronic records systems in practices and hospitals must adopt to reach a mature level. The requirements for electronic records systems are set out as 'core' and 'menu' items, and achievement against these scored for each provider/practice to achieve certification.

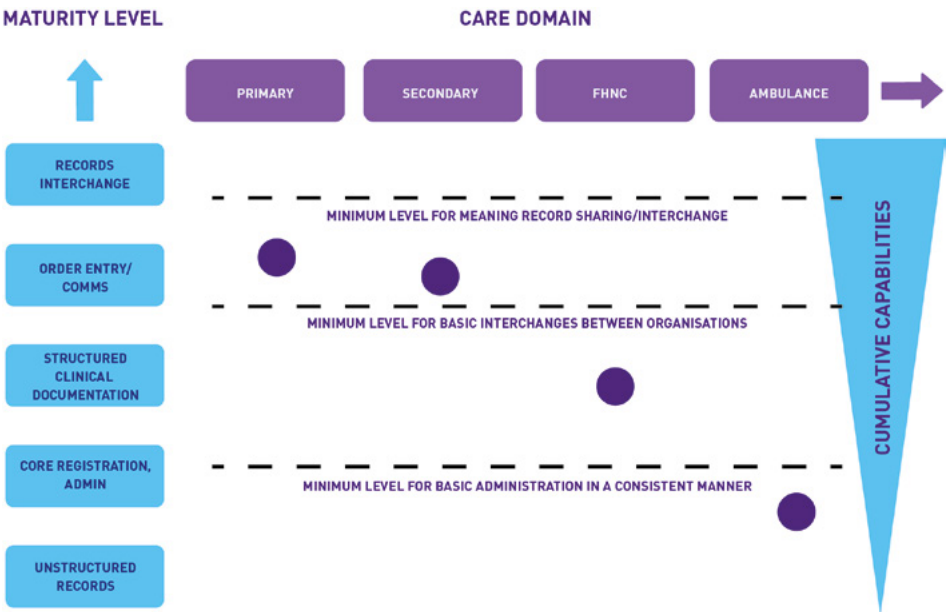
CORE OBJECTIVES (REQUIRED = ALL 15)		MENU SET (REQUIRED = 5 FROM 10)	
1	Computerized Provider Order Entry (CPOE)	1	Drug-formulary checks
2	E-Prescribing (eRx)	2	Incorporate clinical lab test results as structured data
3	Report ambulatory clinical quality measures to CMS/States	3	Generate lists of patients by specific conditions
4	Implement one clinical decision support rule	4	Send reminders to patients per patient preference for preventive/follow up care
5	Provide patients with an electronic copy of their health information, upon request	5	Provide patients with timely electronic access to their health information
6	Provide clinical summaries for patients for each office visit	6	Use certified EHR technology to identify patient-specific education resources and provide to patient, if appropriate
7	Drug-drug and drug-allergy interaction checks	7	Medication reconciliation
8	Record demographics	8	Summary of care record for each transition of care/referrals
9	Maintain an up-to-date problem list of current and active diagnoses	9	Capability to submit electronic data to immunization registries/systems*
10	Maintain active medication list	10	Capability to provide electronic syndromic surveillance data to public health agencies*
11	Maintain active medication allergy list		
12	Record and chart changes in vital signs		
13	Record smoking status for patients 13 years or older		
14	Capability to exchange key clinical information among providers of care		
15	Protect electronic health information		

21 ttp://www.ihtsdo.org/snomed-ct
22 http://www.who.int/classifications/icd/en/
23 http://www.datadictionary.nhs.uk
24 http://www.hitecla.org/what_is_mu

And the 'EMR Adoption Model', which partners these, identifies 7 levels of maturity which are cumulative from level 0 upwards:

US EMR ADOPTION MODEL	
STAGE	CUMULATIVE CAPABILITIES
STAGE 7	COMPLETE EMR, CCD TRANSACTIONS TO SHARE DATA; DATA WAREHOUSING; DATA CONTINUITY WITH ED, AMBULATORY, OP
STAGE 6	PHYSICIAN DOCUMENTATION (STRUCTURED TEMPLATES), FULL CDSS (VARIANCE & COMPLIANCE) FULL R-PACS
STAGE 5	CLOSED LOOP MEDICATION ADMINISTRATION
STAGE 4	CPOE, CLINICAL DECISION SUPPORT (CLINICAL PROTOCOLS)
STAGE 3	NURSING/CLINICAL DOCUMENTATION (FLOW SHEETS), CDSS (ERROR CHECKING), PACS AVAILABLE OUTSIDE RADIOLOGY
STAGE 2	CDR, CONTROLLED MEDICAL VOCULABULARY, CDS, MAY HAVE DOCUMENT DOCUMENT IMAGING; HIE CAPABLE
STAGE 1	ANCILLIARIES - LAB, RAD PHARMACY - ALL INSTALLED
STAGE 0	ALL THREE ANCILLARIES NOT INSTALLED

When applied to an individual digitisation project such as the implementation of an electronic record in, say, a GP practice or hospital, they act as a checklist of functionalities that must be present, and a measure of how sophisticated the implementation is. The power of the functionality/models is when maturity is considered across the whole health and care system in concert:



Individual care domains must achieve a level of capability to interoperate meaningfully with other parts of the care sector; for example, a primary care system that is able to request tests and receive results cannot operate meaningfully without the secondary care maturity being at a comparable level. We therefore need to drive improvements across the sector in a coordinated way, such that the major interactions are between key domains are supported properly.

Commitment 3: Jersey will develop a whole-system 'maturity model' approach to managing the incremental improvements to every digital / records system to ensure that meaningful interoperability is achieved for the major clinical / care interactions between parties, e.g.results, referrals, medications updates (by March 2017)

The following are all areas where care professional colleagues have indicated a high benefit / value of providing better digital support (refer to Annexe II for 'priorities grid'):

- 'person at risk' situations, especially children, where notification / flagging is critical
- Primary care interactions
- Emergency care situations
- test request / results (laboratory, imaging and clinical investigations)
- medications, including current and recent changes, and prescribing risk management
- electronic referrals and discharges

As a result of discussions with professional colleagues we have factored these into the roadmap as 'immediate term' deliverables.

4.2 Unique Identifier for Individuals

4.2.1 Universal Identification Across All Parts of the System

To deliver 'joined-up' care, records about an individual must be shared with other agencies, and supporting activities such as referrals, tests requests, or discharge summaries must all be linked to the individual to create a comprehensive picture.

Structuring records, as we have already outlined above, is one part of the

answer, but we also need a way to guarantee that activities are correctly linked to the right person as getting this wrong could have major and potentially life-threatening consequences.

The most common way of providing this level of guarantee is to ensure that each and every health and care interaction carries common identifier information, unique to the individual, and which are 'assured' by governance processes which limit the chances of 'duplications' or 'confusions'[25]. There are many examples of such unique numbering schemes, for example NHS Number in England and CHI number in Scotland which are mandated across all parts of the health systems in those countries.

A commonly used number in health and care is the Social Security Number or "JY number", which is issued to all people resident in Jersey, and is unique to an individual. It is routinely used in Primary Care settings to identify patients and undertake claims for payment from government. There are also other numbering schemes used in local systems, for example the Hospital Number used in TrakCare in secondary care, Case / Client Reference in social care, amongst others.

When interchanging information between organisations/systems we need to be able to cross-reference these different numbers to guarantee that we are linking the right patient/service-user events with the right person. If the JY number is used in the manner intended by legislation, then it could operate effectively as a common identifier which could be increasingly utilised across all health and care settings.

However, we will still need to be accommodate local identification / numbering systems because; i.) local numbers may be tied to important local business processes or physical records, ii.) may be required by separate legislation covering that particular topic / area, iii.) may be independently established or controlled, as might be the case for commercial entities / online health and care services, or iv.) may be impossible to accommodate the JY number in local systems due to technical constraints.

To allow for each of the above circumstances, we will need to create a way of 'looking up' details of a person's details in each transaction / record interchange scenario, so that we can translate codes and identifiers used in one system with those in another, to be sure that we are correctly linking together data about the same person.

25 confusion = two people with the same ID, duplication = more than one ID for a person

There is no current mechanism for doing this systematically, although in practice we find that JY Number and Hospital Numbers are both recorded for patients attending hospital so 'translation' is possible in that setting. We need to ensure that identification and translation is possible in all settings, and the work of the eGov team holds some promise for helping solve that problem.

The eGov "People Directory"[26] programme intends to create a means for glueing disparate person reference numbers together, so that individuals in Jersey are better able to interact with government digitally, and which will ultimately introduce a portable Digital ID[27] across all government services.

Health and care services could gain significant advantage of this type of service, with a Digital ID and person identification / validation services providing mechanisms to:

- authenticate users of online / digital services, for example, to gain access to individual patient / service-user records, or to book or change an appointment with a GP surgery
- provide a means to confirm identity of a person who is the subject of a data interchange or transaction between two agencies / services, for example, requesting of tests / delivery of results between primary and secondary care
- improve the accuracy and reliability of data linkages when bringing together data from disparate services, for example, linking social care client contact data to primary care condition data to better coordinate the package of care to the individual

It is our expectation that during early 2017, the "People Directory" will be undertaking pilots with a small number of services to test out the different modes of operation, and the technical and operational practicalities of implementing identification services. We will work with the eGov team to explore the feasibility and opportunities for using these identification services in health and care settings during 2017. If these prove to be successful, we will then look to introduce them into the Jersey Care Record solutions as they are developed and implemented during 2018 and 2019.

Where possible, we should also seek to promote the JY Number as a key identifier in all health and care interactions, extending its use beyond the hospital and primary care settings into others able to support it, either as the

26 https://blog.gov.je/2016/05/11/people-directory-slide-deck-12-may-2016/
27 https://en.wikipedia.org/wiki/Electronic_identification

dominant identifier or as an 'alias' or 'auxiliary' identifier in the local system.

In all cases supporting processes for number maintenance and housekeeping, such as removing duplications or confusions, must be in place in each organisation that originates, confirms or modifies numbers in the normal course of their business. Particular attention will need to be applied to key processes such as initial registration of new persons, as this is often a key source of data quality issues, based on our experience elsewhere.

Commitment 4: We will explore the use of the "People Directory" to provide identification services across all health and care interchanges, to increase the accuracy of matching records across systems and services (by December 2017, for test request/results, and by early Q2 2018 for JCR record population)

4.3 Jersey Integrated Care Record

4.3.1 Introduction

If the first foundation stone for 'joined-up' care is ensuring that all parts of the health and care system have digital systems which capture information in a structured form, and the second, a strong unique identifier so that we can be sure about the subject of care, then the third foundation stone is the creation of a place where the digital information is collated and exchanged; sometimes referred to as a Health Information Exchange (HIE)[28], or an Integrated Care Record.

4.3.2 Benefits of Integrated Care Records

In any health and care system there are collections of information about individuals, patients and service-users held locally within the boundaries of each service, and in the records systems they use to help them manage care processes, for example EMIS in primary care and TrakCare in secondary care, CarePartner in Mental Health, etc.

With information in these discrete 'buckets' it is difficult for any care professional to form a complete view of the care that the person has received in different care settings/organisations, and this could materially affect subsequent course of treatment or interventions. It is important that any care professional has as much contextual information as possible to help make the best, safest decisions that they can, at each step of a person's journey through the health and care system.

28 https://www.healthit.gov/providers-professionals/health-information-exchange/what-hie

There are many articles written on the benefits of integrated care records, but rather than simply list those we thought it would be helpful to reflect some of the real-world benefits from care professionals themselves, from one of the NHS exemplar Integrated Care pilot sites; Bristol, North Somerset and South Gloucestershire (BNSSG) "Connecting Care" Pilot.

The whole point of an integrated care record is to bring together information from all the different services, contact and intervention points into a single comprehensive record which can be used by care professionals in any setting to form as complete a picture as possible of the individual needing care.

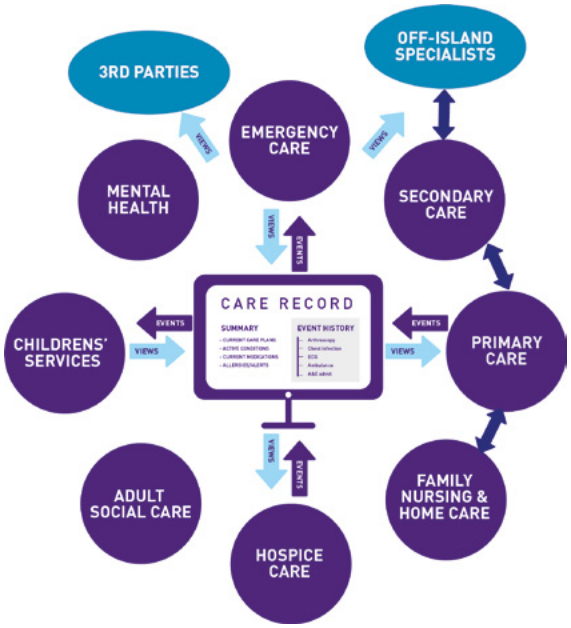
The benefits to patients and service-users is significant; care professionals who: i.) are able to use relevant information to help them make better decisions about an individual's care, ii.) avoid wasting time locating essential information, iii.) can coordinate activities for that person, all combine to give that person much better care, that is likely to be safer for them, and which avoids waste of time and effort.

4.3.3 Summary or Detailed Care Record?

In the NHS in England there is a Summary Care Record Service (SCR)[29] which is similar in concept, but as the name suggests is a simple summary version of an individual's care information. The SCR is accessible in many different clinical and care settings, for example primary care, secondary, community, pharmacy, amongst others.

Whilst the summary is useful, it does not provide a rich 'event history' of the health / care interventions that the individual may have undertaken, and importantly, those which may be relevant to the current condition or treatment intentions.

In studying other health systems in Denmark, Estonia, Sweden, Singapore, Canada, and exemplars in the UK (Bristol, Leeds, Liverpool, Hampshire et al), there is strong pattern emerging of Integrated Care Records with much richer clinical, care and event information, aimed at providing the best possible basis for care professionals' decisions. We believe that Jersey should follow this pattern and introduce a Jersey Care Record (JCR), building a comprehensive care record, drawing information from multiple sources:



Defining the exact content and structure of the Jersey Care Record (JCR) will need to be the subject of discussions between care professionals from many disciplines in months following the introduction of this strategy. Care

29 http://systems.digital.nhs.uk/scr

professionals will need to work together to establish / define:

- the critical summary elements should be present in every record e.g.current medications, active care plans, active conditions, current bookings (future) etc
- the different types of care events that should be included in the event history, and in what priority order these will need to be included e.g.referrals, discharges
- what notifications, alerts and warnings need to be visible in the care record
- the ordering / presentation of information (and means of locating key facts)
- the extent and depth of information associated with each recorded event in the JCR (eg full ECG trace, or just the outcome?)
- whether care professionals can 'request additional information' based on an 'event' listed in the JCR, and the processes for fulfilling that request
- the protocols for access to records in JCR (see later section in this strategy)

Rather than start from scratch, we should build on work done in other countries that have already established the basic parameters / designs for integrated records. Standards such as NHS Digital Interoperability Toolkit[30], Clinical Document Architecture (CDA)[31], Association of Medical Royal Colleges Record Keeping Standards[32], international OpenEHR[33] standards etc, should all be considered to agree a common framework.

It will important to ensure that the eventual technical solutions chosen/ developed to support the Jersey Care Record are able to interoperate easily with the wide variety of existing health and care systems, and those not yet specified or implemented, and must use common international standard techniques for doing so, to avoid the JCR becoming a 'closed system' and restricting its future enhancement and onward development.

If the JCR is to be used in all health and care contexts, and it is our intention that it is, then we will need to ensure that the record is as current as possible, so that it caters for emergency care situations where time is critical; out-of-date information, even if this is say 24hrs behind, may be a significant determinant of the outcome of care in those precious moments.

Commitment 5: We will commit to the creation of a Jersey Care Record that

30 http://systems.digital.nhs.uk/interop/itk/faqs
31 https://en.wikipedia.org/wiki/Clinical_Document_Architecture
32 http://www.aomrc.org.uk/wp-content/uploads/2016/05/Standards_for_the_Clinical_Structure_and_Content_of_Patient_Records_0713.pdf
33 http://www.openehr.org

is a comprehensive repository of real-time individual health and care system interactions, using common industry standards, and to an agreed content structure determined by Jersey care professionals (complete by 2025)

Implementing the JCR is likely to be a long term endeavour, certainly those countries that have done so already have taken a number of years to evolve mature solutions, for example Estonia, Denmark, Canada et al. in the early days we expect the JCR to carry essential information only, starting with the JCR acting as a 'passive' repository (ie receiving and storing information) initially, and then over time incrementally increasing its richness, and the ability for the JCR to become an 'active' repository (i.e. triggering certain alerts, actions based on event/data content).

The experience of exemplars in the NHS in England also suggests that alongside some practical technical constraints, the most common issue is handling information governance record sharing agreements / protocols for fully informed patient consent, and we will therefore need to allow sufficient time in our own programme for designing suitably effective consent/governance protocols.

4.3.4 Pathways & Care Plans

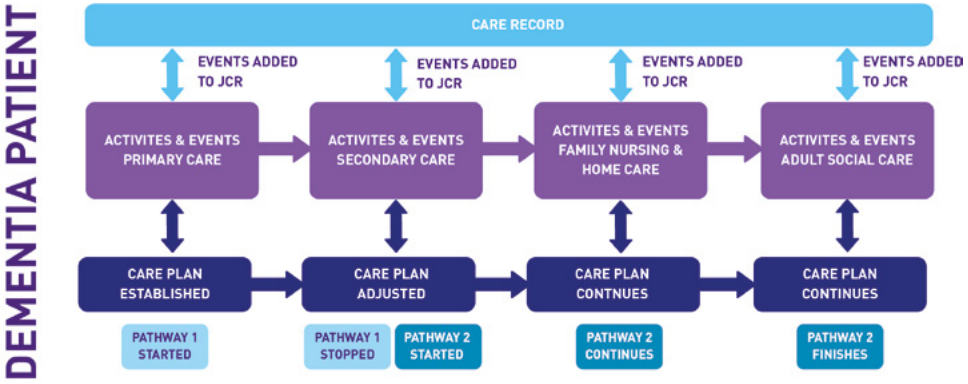
The creation of a common care record, abstracted from individual care settings / systems and held centrally, brings with it the possibility of creating care plans that span multiple agencies and holding them alongside the care record, so that they are accessible to care professionals (and potentially patients / service-users) wherever care is being delivered. This is especially relevant for patients / service-users with multiple conditions, or long term complex needs.

This potential cross agency capability also extends to care pathways, enabling these to be identified and tracked throughout an individual's journey through the health and care system, for example a dementia patient may pass through a number of agencies, and tracking the patient's journey along these pathways and across agencies is beneficial[34] for both care professionals and patients alike.

Over time, the body of data built up about compliance with recognised pathways is a useful tool for auditing practice and improving quality.[35]

34 http://www.ageuk.org.uk/Documents/EN-GB/For-professionals/Research/CPA-Effectiveness_of_care_pathways.pdf?dtrk=true

35 https://www.kingsfund.org.uk/sites/files/kf/field/field_document/Outcomes-measuring-quality-the-king's-fund-aug-2012.pdf



There are some notable examples of care plans as part of complex networks, especially in London; the Coordinate My Care (CMC)[36] programme aims to provide clear patient care plans and preferences for patients with terminal illnesses, and ensures that all agencies are aware of those plans when dealing with patients.

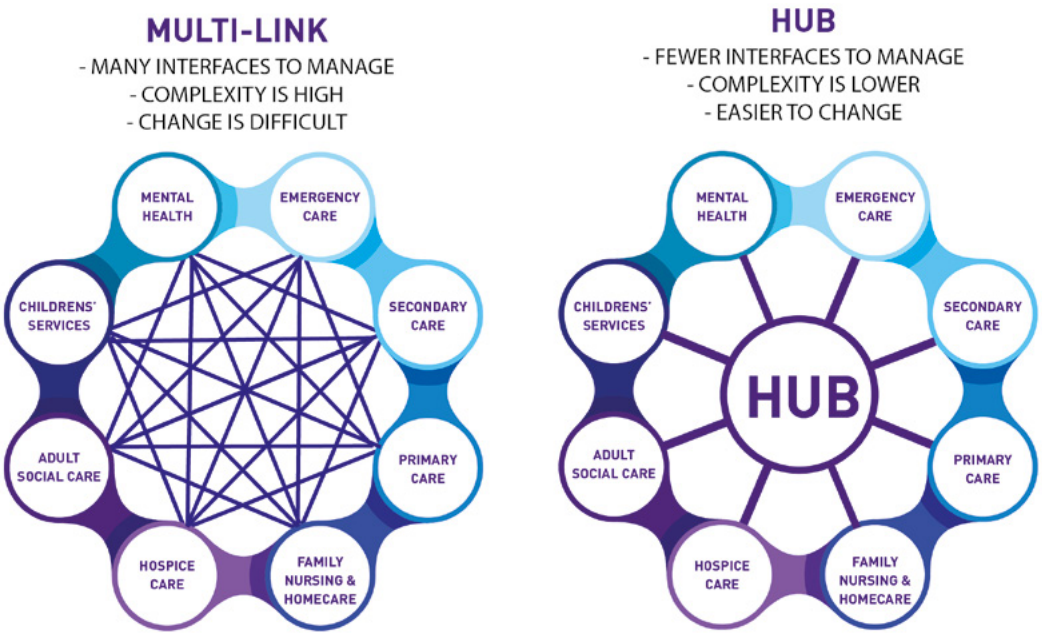
CMC have managed to integrate their system with the mixed network or primary, secondary, ambulance, care homes, hospices, 111 and Out of Hours services in London, such that care professionals can access care plan information whenever needed, and importantly, through the lens of their own particular computer system, rather than a third party portal / viewer e.g. GP's viewing care plans through EMIS.

Commitment 6: We will implement a care plan and care pathway management capability alongside the Jersey Care Record, so that all care professionals have access to current plan/pathway information, and patients can set preferences for resuscitation, preferred place of death etc (progressively between 2020 and 2025)

4.3.5 Integration Model

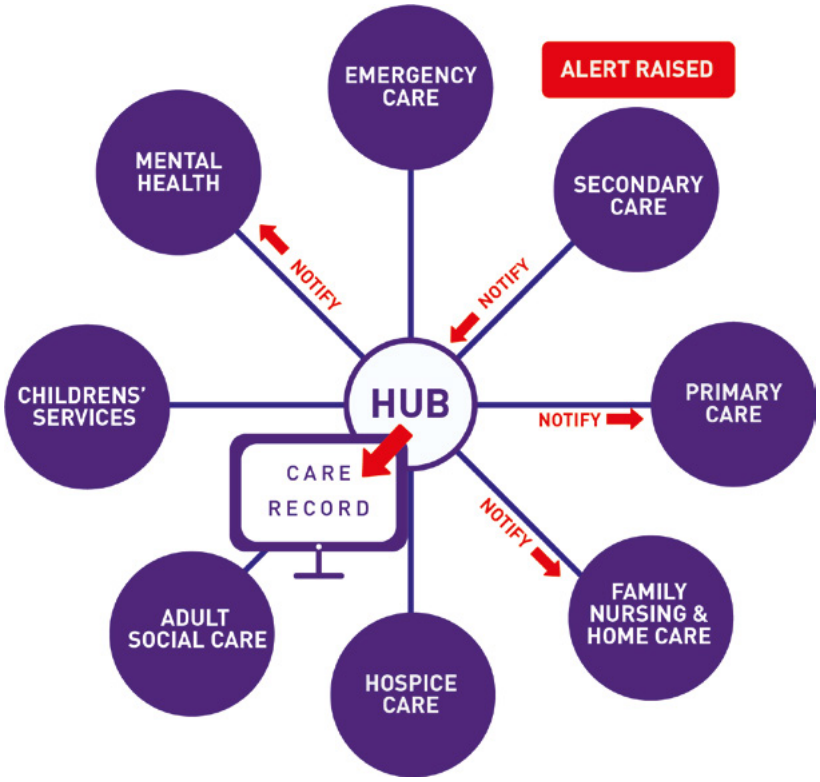
There are several ways in which data could be joined-up to create the needed integration of services; the two most favoured models are 'point to point' and 'common hub'. In a point-to-point model systems are directly interfaced with each other. This model works fine when there are few systems which need to integrate as any subsequent changes to systems are easy to accommodate. However, when there are a larger number of systems which need to be interfaced the model breaks down rapidly because there are too many point to point connections that must be created, as illustrated below:

36 http://coordinatemycare.co.uk http://coordinatemycare.co.uk



In Jersey we want to integrate the whole health and care system over time, which means interfacing numerous systems across the landscape, so the only realistically viable model is the 'hub' approach.

In effect the alert would be 'published' (in a secure way) to the hub, and any 'subscribers' to that type of alert would receive the message in their local systems. In all cases the 'alert' would also be stored in the JCR (again, securely) so that care professionals could also see that alert through a JCR online portal, even when they are not sat in front of their usual computer system. This type of publish and subscription model is very flexible, and it is much easier to maintain business logic in one place, rather than have to modify very many point-to-point interfaces every time a rule change is made.



Deciding what should / shouldn't be published, and who can subscribe to the different types of business logic related alerts, is something that would be done as part of deciding the content of the JCR itself, as described earlier, and of course would involve a range of relevant care professionals in their design.

Commitment 7: We will implement a 'hub' model as the logical mechanism for linking together data and systems and interchanging health and care data (during 2017)

As with the JCR described earlier we would expect that the 'hub' would utilise commonly available, open standard technologies (eg HL7[37]), so that it is easier to integrate new systems, and make changes down the line.

4.3.6 Accessing and Using Care Records

There is little point creating a JCR to facilitate joined-up care, if we do not also put in place suitable mechanisms that allow different types of users to access those care records in meaningful ways. There are three main types of 'users' of a JCR; care professionals, patients/

37 https://www.hl7.org

service-users, and automated systems, as outlined in the graphic below:

4.3.6.1 Professional Access

Care professionals want to have a rich set of information available to them to make the safest and best decisions that they can, in the interest of the patient / service-user. In many cases those care professionals will be accessing that information through their 'normal business systems', for example EMIS in primary care.

Adopting the principle of 'person centricity' established earlier, we need to configure the information for care professionals around them – they are the 'person' in this case, with the subject being the patient / service-user. That would tend to suggest that the ideal scenario is to integrate that information within their 'normal business system' (i.e. the system they use every day of the week), be that EMIS, TrakCare, CarePartner or other local system.

There is an important aspect here that we must also consider; simply displaying information in those 'normal business systems' is not the same as having that data codified and included in the that system. In the case of EMIS, there are local business rules, and alerting logic that are triggered on the data – simply providing a viewing capability would not facilitate this kind of triggered logic to

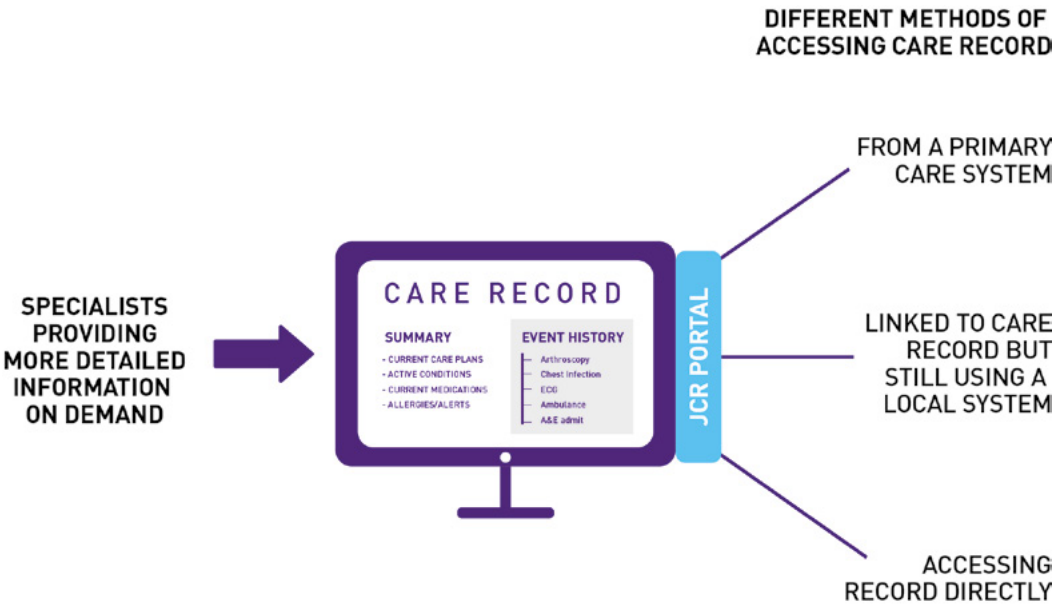
happen, and that may affect the care given to that patient. The desirable state is for information that is included in the JCR to be pushed into EMIS, in this example, so that the safest and most effective decisions can be made.

However not all 'normal business systems' operate in the same way; some are sophisticated business systems with embedded logic and workflows, and some are simply records keeping systems. We must have a model which can accommodate three main scenarios:

- Where the local system can support it, information that goes into the JCR can be cascaded to the local system in a codified manner, for all 'subscribed' message/events. For example, earlier we mentioned the 'alerting' scenario. If the local system is subscribed to that 'alert' business rule, then a set of codified information will be pushed to that system via the hub/JCR. Exactly what information is pushed, and in what situations, is the subject of further work beyond this initial strategy, but the principle of being able to physically push data to systems is important to engineer-in from the outset
- If a local system cannot support the receipt of codified information directly, then the next best scenario is to ensure that the care professional can access the additional information that is present in the JCR from the confines of the local system they happen to be using at the time; this could be either embedded into the local system (so that sign-on credentials don't have to be re-entered), or as a 'pop-out' to the JCR portal to view the additional details that are present there
- Also, the extent to which a care professional could 'get the detail' behind any particular event in the JCR will of course depend on decisions about how much information is carried by the JCR itself (see commitment 5 regarding decisions about content), however we should also accommodate the capability to 'request additional detail' from the originating care professional and have that information delivered into the JCR or directly to the requestor (see also commitment 16 regarding professional to professional communications)
- Where a care professional has no 'normal business system' available to them at the point of delivering care, they ought to be able to access the JCR directly through its own online portal, using any device. The range of actions that they may be able to carry out when accessing through this route is likely to be more limited than if they were using their own local system, certainly in the early incarnations of the JCR, but it will evolve over time to enable a wider range of functionality, such as prescribing, booking etc.

In the latter scenario where the purely online JCR portal is used, any information which is captured online or any actions which are initiated online will create a flow of information via the JCR/Hub, into the relevant 'normal business systems' for that care professional, so for example a social worker booking an appointment with a client using the online JCR portal, would expect that information to flow into the social care system in the background, without them having to re-key anything when they get back to base.

To illustrate these scenarios:



In certain situations, such as a referral to a third-party specialist service on the mainland, care professionals in those organisations may need access to the detailed JCR so that they can treat patients safely and effectively. However the same mechanisms as described here will apply i.e.movement of relevant information to their 'normal business system', or granting access to the JCR portal where the former is not feasible.

Commitment 8: The JCR will enable any actions carried out directly online, to be integrated into care professional regular systems, to ensure that we make the most use of safety / better care logic built into local systems (complete by Dec 2022)

There are some technical challenges with providing the kind of interactions that are envisaged in the scenarios above, but they have all been surmounted in other countries that have successfully implemented integrated care records, and we can learn from those.

4.3.6.2 Patient / Service-Users

It is our intention to allow Patients and Service-users access to the JCR so that they can see what information is captured about them, who has accessed their information, carry out some transactions, such as booking an appointment, and eventually be able to contribute to that record themselves, augmenting the professional care record with information that they may have captured on a mobile device, or home monitoring kit or similar.

There are of course some situations where patients / service-users accessing information might be detrimental to them; social care, and mental health scenarios are the most commonly cited examples. As a result, the JCR will need a set of clear access and governance protocols to cope with a range of scenarios, and those will need to be decided by a wide stakeholder group of care professionals. It will also need the technical mechanisms to enact those protocols in real-time, as patients or professionals access the record. However, again we can build on work already done in other countries.

We expect the JCR to also hold information about the patient / service-users individual care preferences for example, 'preferred place of death' in the case of palliative care patients. The JCR/Hub is an ideal place to hold this kind of information because it is accessible from anywhere, and with business logic capabilities embedded, any changes to those preferences could be cascaded to any connected, subscribed system.

The same logic would apply to patients / service-users choosing which information in the JCR is / isn't shared, and with whom. In most implementations of an Integrated Care Record, there is the concept of 'record sharing control', where patients / service-users can turn on/ off different access rights to elements of their record, much as one might do when turning on/off notifications or location services[38] in Apple / Android mobile devices.

Commitment 9: Jersey is committed allowing access patients and service-users to access, and ultimately interact with the JCR, for sharing / restriction, holding care preferences, and undertaking health / care actions, according to clear, well defined access and governance protocols that work in the best interests of patients / service-users at all times (by December 2022)

Significant thought also needs to be given to the design information presentation for patients and service-users to avoid confusing or worrying users unnecessarily, and presenting that information in the most helpful ways to the user. The principle of 'person-centricity' is important here, so configuring

38 https://support.apple.com/en-gb/HT203033

the most relevant information around the person according to the context of their current interaction is critical, for example a patient event history is not critical information when making an appointment to see a GP. There are some really strong examples of patient-focused portals around the world, built on top of national integrated care records, for example the Danish sundhed.dk[39] portal, which we can learn from.

4.3.6.3 Systems and Automated Access

Embedding 'business logic' into the JCR/Hub concept allows the JCR to perform a range of autonomous actions, according to agreed business rules. The 'alerting' scenario illustrated earlier is just one example of the JCR/Hub carrying out an autonomous action without direct care professional or person initiation.

There are many logical extensions to this concept; firstly, increasing range of 'human designed' rules that could be embedded, to include say, additional alerting scenarios, and secondly, 'machined designed' rules where software 'learns' about the data, and provides its own suggestions for the next logical action. We call this latter scenario 'machine learning'[40] or 'cognitive computing'.

To be able to undertake machine learning, very clear governance rules for access to the data, and the ways that data can be used by an autonomous process will need to be established. This is clearly an experimental area, but it is one that is expanding exponentially, and holds significant promise for health and care services in supporting care professionals to deliver better care. As the JCR/Hub is established, then the capability to support this type of activity increases, and it would be an area that Jersey could innovate faster than many other countries, because of its size, scale and governance of health and care system.

Commitment 10: Jersey will capitalise on the potential of JCR to drive improvements in health and care for its residents, using 'smart' data techniques such as machine learning (during 2018/19)

4.3.6.4 Access Protocols & Governance

Clearly access protocols are critical to ensure that the JCR is used in an appropriate manner, and in a way that supports and promotes joined-up, safe and effective care. There is a risk that such protocols, and the governance mechanisms around them become bureaucratic and lose focus on the key reason why the JCR exists, which is for better care.

39 https://www.sundhed.dk
40 https://en.wikipedia.org/wiki/Machine_learning

There is also a risk that the opportunities that commercial, academic and others parties might bring to improving care are also not given the chance to flourish because protocols do not take into account the potential benefits that such work might create.

For example, a smart device manufacturer that wishes to develop an advanced home care monitoring tool, the data from which could augment the individuals professional care record to help make better decisions, but whom cannot 'connect to the record' is unlikely to complete the development successfully and launch the product. We need ways of working with industry to facilitate innovation, and incubate such ideas, granting 'safe access' to JCR/Hub.

Our suggested model for governing access to the JCR is to put in place dedicated JCR governance, comprised of a wide range of stakeholders, including public, service users, health and care professionals, patients, service-users and others, to oversee the creation of a set of protocols which protect and support the interests of patients and service users, but which also allow innovation projects to flourish around the core records services.

Commitment 11: We will create a Jersey Care Records Governance Group to oversee protocols for accessing the JCR, and to ensure that the JCR is exploited in a safe and secure manner, in the best interests of patients and service users (during 2017)

There are existing examples in Jersey of independent governance vehicles which could be used as a model for the JCRB, for example the Jersey Financial Service Commission (JFSC), which has many of the oversight characteristics we envisage, but which also has a regulatory role which we do not believe is necessary for a JCR at this time, although it may be a model that we ultimately move towards in future years as the JCR service matures.

4.3.7 Ownership for JCR Data

One of the big debates in developing this strategy has been deciding the ownership and control of the data that would be present in the JCR, as certain 'ownership models' would require a change of legislation, or as a minimum a change of clinical and/or professional responsibilities, for example some jurisdictions have made changes to put patients / service-users as owners of their data[41].

41 http://ec.europa.eu/health/ehealth/docs/laws_report_recommendations_en.pdf

A large number of countries have used existing legislation to cover the use-case of health and care data, and preserve existing ownership models whilst also giving much greater control over the use of records, access to them, and personal involvement in the process of care.

There are two aspects we consider significant:

- Firstly, the degree to which the patient or service-user has control over the information that is captured about them, and who can / can't access that information
- The information that is necessary to be captured for the purposes of delivering care to patients / service-users, which professionals operating that system must utilise in order to deliver safe, effective care

The first of these points we plan to address with the JCR through; i.) the access rights that patients will have through agreed protocols, ii.) the capability within that system to support sharing preferences, iii.) visibility of who has accessed their records, iv.) the possibility to augment that with their own data over time. The combination of these facilities should put a significant amount of control into the hands of patients and service-users.

On the second point, we do not envisage changing the current situation; each care professional is responsible for their own contribution to any person's care records, and in judging the contributions of other care professionals to that record similarly – there is no concept of the 'master care professional' overseeing all health and care data. In the JCR we must therefore make sure that the source of every piece of data about the individual is clearly identified to the relevant care professional, then other care professionals can judge that information in context when consulting with patients / service-users.

Commitment 12: All care professionals contributions to JCR will be their professional responsibility, and their contributions will be explicitly identified in the JCR, so that other care professionals, patients and service users are able to consider the validity and relevance of that information in context (protocols established during 2018/19)

4.4 Supporting Self-Directed / Managed Care

Building on the previous point about 'patients being in control', one of the clear aspirations in the health and care strategies described earlier is the desire for patients and service-users to take more responsibility for their own situation, both in terms of general health and well-being, but also in the coordination of

their care, and the ways in which they access that care.

The introduction of a JCR goes a long way towards enabling patient / service-users access to information about the things which have happened, or are in the process of happening, but it also needs to be supported by capabilities which would allow 'the next step'.

For example, take a patient on a dementia pathway: part-way through that journey it requires the patient, or their family, to make important choices about living at home, or moving to residential care; they need to be aware of the potential options at each stage of the journey, with sufficient information to help them make that choice, and potentially make the arrangements / booking at themselves.

The sorts of capabilities that must be available to support self-direction are typically:

- Information resources; curated information about conditions, treatments, pathways, for example WebMD[42], NHS Choices[43]
- Toolkits; resources which allow people to make assessments of their condition, or situation and suggest methods of dealing with their condition/ situation, for example NHS Choices toolkits[44] or Ottowa Health Patient Decision Aids[45]
- Directories of services; what services are available, how to access them, for example Health Direct Australia[46], NHS Choices in UK[47]
- Transactional support; being able to make a booking, or schedule something as a result of making a choice or understanding a condition better, for example My Health Online, Wales[48], Doc Appointments Online, Australia[49]

Each of these plays its part in enabling patients / service-users to understand more about their own condition / situation, to locate services that might be relevant to them (which may be provided by the State, private services or indeed commercial or off-Island 3rd parties e.g.NowGP[50]), and importantly undertake a physical action as a result. An example of this sort of comprehensive information / directory / actionable resources is www.nhs.net in England, and

42 http://www.webmd.com/a-to-z-guides/common-topics/g.htm
43 http://www.nhs.uk/Conditions/Pages/hub.aspx
44 http://www.nhs.uk/Tools/Pages/Toolslibrary.aspx
45 https://decisionaid.ohri.ca/
46 http://www.nhsd.com.au
47 http://www.nhs.uk/service-search
48 https://www.myhealthonline-inps.wales.nhs.uk/mhol/home.jsp
49 http://docappointments.com.au
50 http://www.nhs.uk/service-search

the www.sundhed.dk portal in Denmark.

If we want to support patients and service users to take more control, then we need to put each of these capabilities in place, and do so in a way that keeps them closely coupled with the JCR/Hub and with the access portals that provide the 'way-in'.

Commitment 13: We will put in place online, curated information resources which help patients and services users understand their condition / situation better (during 2018)

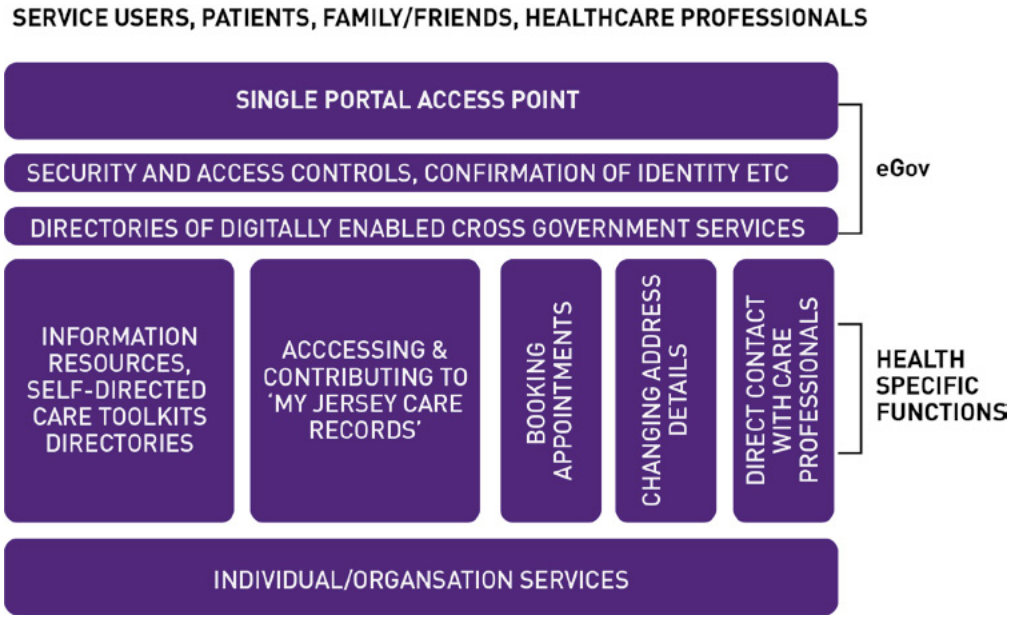
Commitment 14: We will expand the Jersey Online Directory to include details of all services that could be consumed by patients and service users, in an easy to use, understandable and accessible directory, and in a way that provides a direct bridge into those services to be able to access them, rather than simply an address book of locations (during 2018)

Commitment 15: We will ensure that there are a number of useful 'transactional services' linked to each of the elements in the Service Directory, so that patients and service-users can book, schedule, or otherwise access those services from the one portal (during 2018)

Unsurprisingly, our plans for a portal to allow patients and service-users to access an increasing range of health and care services and information resource is aligned with the aspirations of eGov programme.

The eGov programme is developing a single cross-government portal for all citizens to interact with government / public services in a much more effective manner. This portal would be he natural 'start point' for patients and service-users wishing to access health and care services / information resources, and provides a gateway through which those users could go on to complete their care journey.

As more health and care services become available through non-traditional routes, such as online consultations, then the single portal becomes the natural place for these 'options' to be presented to patients / service-users.



As well as creating a place where non-traditional services could be located, we of course want to ensure that existing / traditional services are accessible through this mechanism equitably, for example a patient can make a booking with a GP surgery from the portal at any time of day, without requiring a surgery to be open.

This kind of interaction requires those underlying services to be 'open and inter-operable' such they can be integrated into online solutions; the benefit that 'interoperability' brings is that it gives us many more options for how we can present services to users through portals, or on mobile devices, without exposing those users to full complexity of professional systems like TrakCare or EMIS (see section 4.7 also).

4.5 Connecting Care Professionals

Coordinating care across multiple agencies requires care professionals to be in contact with each other; sometimes that is more formal contact in the case of, say a multi-disciplinary-team review of a particular patient or service-user, and at other times more informal, to perhaps chase a result or check a comment in a discharge summary.

Effective communication between care professionals 'oils-the-wheels' of care processes and improves the overall quality of care / service to patients. We need to provide mechanisms which allow care professionals to connect with each other using smart digital techniques; the rise of 'instant communication'

is one of the massive growth areas in consumer technology, but it does not feature heavily in health / care interactions, which are currently rooted in letters, email and good old fashioned phone calls.

One of the reasons why this is the case is that there is no real universal directory of care professionals which encompasses all of the different disciplines and domains that may come into contact with patients / service-users, and no way of identifying whether those care professionals are actually contactable at any point in time. To address this we can do two things:

- Firstly, create an online directory of care professionals, which is populated with the essential contact information, service profiles etc for each care professional in Jersey. Thought will need to be given to how this directory is kept current, most probably some form of self-service/updating by care professionals themselves, to avoid contact information becoming out of date

- Secondly, provide a secure contact service operating between those care professionals that supports 'instant messaging', 'instant conferencing' and 'asynchronous messaging', linked to the JCR (or person record in local system), so that there is always a patient / service-user subject recorded against the contact, and which can be included in the person's record

There are a variety of technologies that can support this type of capability, and work subsequent to this strategy will identify which are the most cost effective for Jersey's situation.

Commitment 16: We will create a Jersey care professionals directory which includes all of the essential contact details for everyone working in Jersey (and potentially with partners in Southampton, London and Oxford) (during 2017/18)

Commitment 17: We will put in place a secure messaging/contact infrastructure which supports person-to-person connections between care professionals across Jersey and with partners off-island. (during 2019)

A natural extension of this service would of course be to include patient to professional communications using the same type of approach, however it might be easier to push this type of interaction through the JCR portal, rather than have patients included in the professional-to-professional secure systems. It is an area that needs to be explored further as part of the planning for the professional networking service.

4.6 Connecting Patients

There is an increasing body of evidence[51] which suggests that peer-to-peer contact between patients / service-users is one of the most effective ways of accelerating health and well-being improvements; it is particular relevant in mental health situations where 'group therapy' is a recognised technique.

The US based company "Patients Like Me"[52] introduced a peer-to-peer service to help patients with different conditions connect with each other to help form communities / networks of support. There are currently over 400,000 patients registered with this service, and the number is increasing daily. We believe that there is a place for this type of service in Jersey, in particular to connect Jersey residents with others people around the world who may have similar conditions, and where the individual in Jersey might be the only case of its type for 10 years in such a small local population.

Rather than commit wholesale to this approach at the outset, we would like to explore the viability of this type of service in Jersey, starting with a small pilot, based around certain specific diseases or conditions, and if that proves successful, then incorporate that service into the 'service directory', so that patients / service-users could be 'prescribed' by care professionals, or indeed access that service directly themselves.

Commitment 18: We will pilot a 'Patients Like Me' approach to connecting patients and service-users with others, and evaluate the benefits prior to any formal inclusion in the health and care service directory (between 2020 and 2022)

4.7 Delivering Care in Different Ways

Central to health and care transformation is the delivery of care services in different settings and in different ways; the out of hospital care programme is looking at ways of providing services that have traditionally been delivered in the hospital in community or home settings instead. Evidence shows that this is better for patients, and economically is much better for the system as a whole.

51 http://www.nesta.org.uk/sites/default/files/peer_support_-_what_is_it_and_does_it_work.pdf
52 https://www.patientslikeme.com

However, there are many challenges with this kind of approach, for example systems that capture information that are only visible within the hospital because of technical constraints, meaning that community based staff have to write down the notes on paper and then key that into systems when they get back to base. An unfortunate example of that is the Diabetic Service, where community diabetic nurses capture data on the EMIS system because TrakCare isn't available to them when they are out on the road, then when back at base they have to re-key the information into TrakCare as the formal record, but because of limitations they can't access the EMIS system from the Diabetic Care Centre, so end up writing down notes on paper.

One of the great enabling qualities of digital technology is the ability to render both 'place' and 'system' an irrelevance; as a user of online services such as Amazon, it doesn't matter whether we are at home on the sofa, on the bus on the way to work, or in an office – ordering products is a painless and efficient process, and we don't really care what systems Amazon uses in the background to make it all work...we are not exposed to the complexity of Amazon's back-end stock control, ordering and fulfilment data entry systems as they are all 'hidden' behind a customer facing portal.

We need to think about health and care services in similar ways, to increase the flexibility of where service can be delivered, and not make technology the limiting factor. Generally, this means moving systems to the web, or Apps, and where systems are not currently available with a web-offering, we need to think about ways we can re-provide a viable user-experience by 'opening' the system so that it can be delivered electronically, often utilising open interfaces e.g.APIs[53], and delivering it through the JCR or eGov portals as a 'user facing' system.

As a matter of course, any new systems which we introduce in the health and care landscape should be 'open[54]' to allow us the flexibility of deploying systems in different ways, and importantly incorporating them into the 'Single Access Point' portal in a functionally rich way.

Commitment 19: Enable key systems to be 'portable' by 'web' or 'App' enabling them, through the use of standard Open interfacing / API techniques. (during 2017)

Commitment 20: Working with technical design and procurement colleagues, specify Open / API standards for all new systems so that they are more readily integrated into the landscape, and can be deployed through portals, Apps and other such techniques (during 2017)

53 https://en.wikipedia.org/wiki/Application_programming_interface
54 https://en.wikipedia.org/wiki/Application_programming_interface

If we adopt these approaches, then it may also be possible to deliver some types of services in entirely digitally enabled ways, rather than relying on 'bricks and mortar' approaches, for example, a repeat prescription service could be entirely "Amazon-ed" and placed online.

4.8 Internet of Things / Wearables

There is much talk about the power of the Internet of Things (IoT[55]) and the potential that smart devices could bring to health and care services. Indeed, there are a number of pilot schemes testing out different smart devices, for example in Bradford, West Yorkshire, Dr Shahid Ali has linked IoT patient monitoring devices to the VitruCare system in the practice[56]. There are also near daily reports in the press about the emergence of the latest new device that promises to change the way health and care is delivered, for example, the US company AliveCor that takes ECG traces of heart activity to spot arrhythmia[57], reported by the BBC, just this week.

It is fair to say that the IoT marketplace is immature at this time, but it is expanding rapidly and the concept of collecting more data about patients / service-users in unobtrusive ways has promise for improving care professional decision making and care of individuals. However, at this moment in time, even if Jersey wanted to support an IoT movement in health and care, there is actually nowhere to put the resulting data collected by such devices.

The logical place is of course into the JCR as part of combining personally collected and professionally collected care data, however thought needs to be given to the value of putting all of the data in the record, when actually what is needed is the outcome or key measurement that changes the course of care for that individual; it may be best for a care professional to 'gate-keep' this process to avoid too much superfluous information making its way into the JCR.

In the near future it is anticipated that IoT / wearables will mature as a technology, and concerns about data security and privacy will be ironed out, to the point where they are readily available, and could be routinely used to monitor patients and service-users. We must therefore accommodate devices thinking in timeframe of our digital strategy; technically we may need to provide a secure place where such data could be streamed / stored, and then 'business logic' applied to link that data with patients or service-user

55 https://en.wikipedia.org/wiki/Application_programming_interface
56 https://www.theguardian.com/public-leaders-network/2015/jun/08/nhs-internet-of-things-future-care-patient-control
57 http://www.bbc.co.uk/news/business-37972606

identities, and/or put 'it in the queue' for a suitable professional gate-keeper to review before incorporating it into local systems, or indeed the JCR itself, as illustrated below:

Commitment 21: We will design the JCR and the associated 'hub' services in such a way that could accommodate future inclusion of IoT generated data alongside care records. We will undertake a number of small 'demonstrator projects' to test out the techniques for collection / integration, and help us establish the protocols for handling such data (during 2018)

4.9 Data > Intelligence

Our overall vision says that we want to use the data collected in the course of delivering health and care services to be used 'intelligently to improve care'. To make that vision a reality there are a number of key things that we need to put in place, and they are described as follows:

4.9.1 Capturing Data at Source

One of our fundamental design principles states:

"structured, codified data captured at source, as close to the point of health / care delivery as practicable, is collated, linked and re-used for all other secondary purposes... there should be no need for additional subject specific national dataset collections if the day-to-day processes are designed in such a way as to collect the necessary information as an integral part of day-to-day processes"

It ought to be possible to generate all of the analysis required by health and care leaders, care professionals, auditors, regulators and others from the data that is collected on a day-to-day basis; this is not an unreasonable assumption given that we are attempting to build a content rich care record, which is linked to all parts of the health and care system. Data from the 'event history' in the care record will provide a rich seam of data for analytical purposes.

Further, the development of the new hospital for Jersey presents significant opportunities in the ways in which data could be captured in real-time, for example, real-time capture of patient vital signs using sensors, and inclusion of that data with the patient's electronic care record. Combining real-time data with 'event based' data will create a very rich seam of information to better understand the effectiveness of care / outcome and the quality and efficiency of services delivered.

4.9.2 Linking Data for Longitudinal Analysis

A major challenge in health and care services in the NHS is the linkage of data from disparate parts of the sector, in many ways this is as a result of the lack of any centralised common care record, but it is also because there is a culture of retrospective national dataset collection from different parts of the system, for example hospital episodes (HES[58]), commissioning datasets (SUS[59]), amongst others.

Despite conforming to national data standards, linking data together to form a longitudinal picture of patient care in the NHS can be difficult. The difference with Jersey's approach is that the longitudinal record is cumulatively and continuously assembled in the JCR, based on the unique person identifiers and the 'event history' concept. This will enable easier longitudinal analysis as all the parts of an individual's journey through the health and care system are recorded in sequence.

For researchers, the easy assembly of longitudinal records is a significant bonus, and could make Jersey an attractive place to conduct health / care research.

Commitment 22: As the JCR starts to be implemented, we will begin work to formulate the 'research offer' and start discussing this with colleagues in academia to stimulate interest in Jersey-based health and care research (starting in 2018)

58 http://content.digital.nhs.uk/hes
59 http://content.digital.nhs.uk/sus

4.9.3 Generating Useful Insight

With sufficient data it is possible to generate valuable insight. Whilst Jersey may only have a population of around 100,000 people, the cumulative number of health and care interactions is more than sufficient as a base for statistically meaningful analysis.

However, we do not need to rely solely on the data that is collected in Jersey for insight. Local data could be readily augmented with data from other health and care jurisdictions to provide richer context, for example the Hospital Episodes Service in England processes around 125m healthcare records per year, which could provide a useful statistical base against which to compare Jersey data.

By 'insight' we mean finding meaningful facts in the data that we can actually do something with, in other words it is 'actionable insight[60]'. For example, there is little point a smart digital analytics platform finding a pattern/link between patients with terminal cancer and the fact that they died earlier than average life expectancy.

There are really only two main ways of generating insight from data:

- **People:** clever analysts or 'data scientists[61]' using software tools to create analysis. Relies on the humans understanding both the data and the business context in which the data is being used. For example, the human would understand intuitively that palliative care patients are expected to have earlier deaths than other patients
- **Machines:** software that parses data using algorithmic, or neural means, to find patterns in the data. Sometimes referred to cognitive computing or machine learning, with large volumes of data, machine learning can spot patterns in data that humans might miss

The pace of change in this field of study is phenomenal; artificial intelligence and machine learning techniques are being applied increasingly to health and care problems, to support care professionals to make the best decisions they can. The IBM Watson tool referred to earlier is one of the leading platforms in this field, but there are many other companies exploring this arena.

As it is such an experimental field, but one that we recognise has huge potential, we think it advisable to 'test the water' with machine learning approaches in one or two 'demonstrator projects' to test the applicability to health and care.

60 http://www.forbes.com/sites/brentdykes/2016/04/26/actionable-insights-the-missing-link-between-data-and-business-value/#5a05ed1a65bb
61 https://en.oxforddictionaries.com/definition/data_scientist

Commitment 23: To explore the potential of machine learning and its practical application in health and care, we will undertake a series of research / demonstrator activities in collaboration with industry subject matter experts. (During 2018)

In the meantime, we will need to concentrate efforts on putting in place the right kinds of data platform (closely coupled with the JCR, as described earlier), and the software tools to enable analysts in health and care to produce meaningful insight. There is however a tendency for analytical work to be done in small pockets, rather than as a whole system, so to bridge this issue, we think it would be beneficial to create a "professional analytical network", to help pool data, expertise and analytical capacity to work collectively on analytical problems to improve care.

Commitment 24: We will create a professional analytical network to foster collaborative working on data and intelligence across the health and care system (by March 2017)

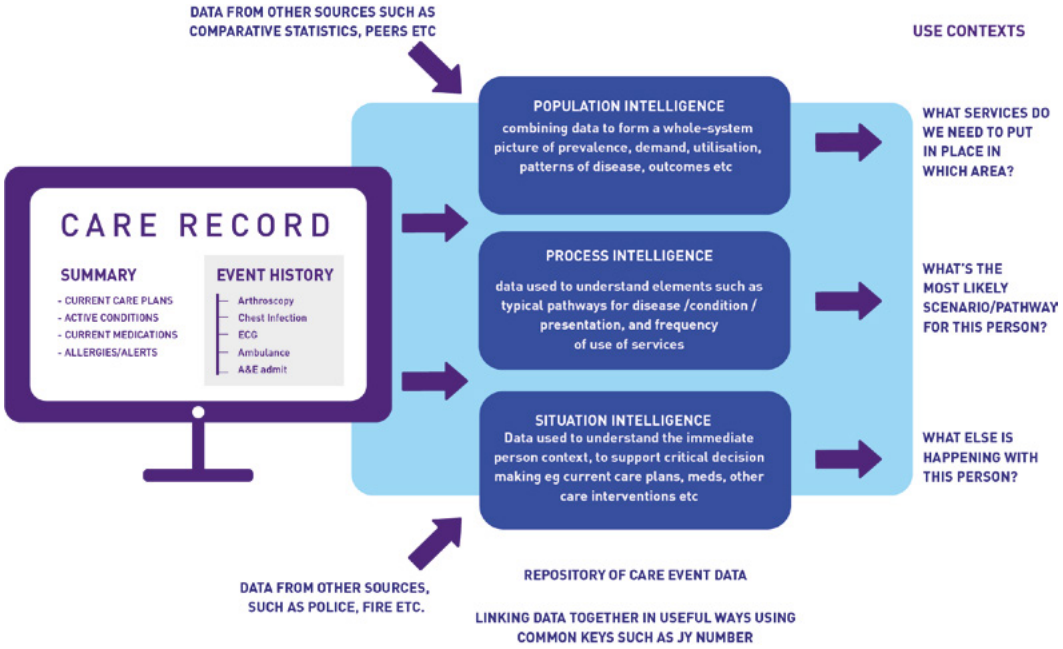
4.9.4 Advanced Uses

It is our expectation that information and intelligence generated from the data collected in Jersey will be used in a number of different contexts, including for example, performance reporting, management information for service monitoring, governance, transparency, assurance, and audit and review.

These represent the foundation uses of information that we would expect to see in any health and care system, but our aspiration is to use data much more actively, for example, supporting care professionals at the point of care to help them make better decisions in 'real-time'; in the truest sense of clinical decision support[62].

62 http://analytics-magazine.org/intelligent-decision-support-in-healthcare/

In summary, our strategic intention is to support both 'macro' and 'micro' decision support with insight and intelligence:



We will need to think carefully about how this type of information is made available to care professionals throughout the health and care system; monthly retrospective reports are definitely NOT what we have in mind. For proper decision support, the information / insight needs to be placed as close to the point of care as possible, and preferably embedded into the systems that care professionals are using on a daily basis.

We will need to explore some of the technicalities and practicalities in each health / care context as we start to implement this strategy, and evaluate whether it is better to place this information in the JCR portal, or whether it is better to embed it into local systems.

Commitment 25: Working with care professionals across the health and care system, we will investigate the most effective way of providing effective decision support to help make better, safer decisions (during 2017)

4.10 Digital Skills

4.10.1 Professional Workforce

We cannot expect the elements described in this strategy to achieve their full potential if the people that use these systems and capabilities do not know how to use them or work with them. One approach is to design systems and services in ways which need little or no training (Apple's design philosophy), and there is obvious merit in that for consumer-facing technology where it is impossible to teach a diverse audience. However, many of the systems in health and care are complex because healthcare itself is a complex business, so specific training in relevant technologies and processes is essential.

However, as we start to abstract data into other systems, such as JCR and the online portal, we have the potential to reduce the complexity to the point where the "Apple Philosophy" could apply. Certainly one of our earlier design principles focuses on designing systems and services around the individual user, and complete 'end-to-end' processes, but even so there are still likely to be some digital training and skills development needs across different health and care professionals.

Because health and care is complex, we believe that it is not just about "showing people how to use websites", there is an element of understanding the purpose of the digital interaction, for example, being able to access a care record, understand its content, to navigate it effectively, and to initiate appropriate actions as a result. We think there is merit in creating a 'digital health and care skills programme' to support the introduction of JCR, portals and data tools outlined in this strategy, offering training and support to health and are workers across the sector that it is relevant to their individual care domain.

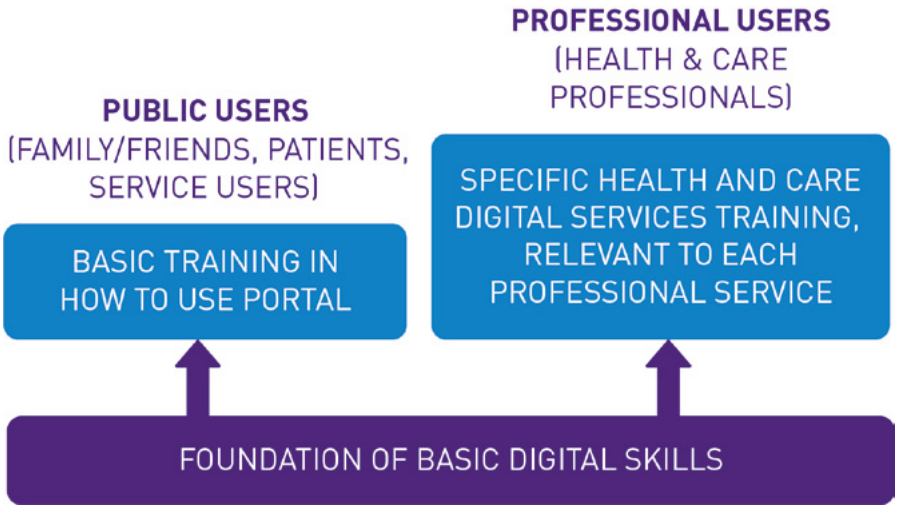
Commitment 26: We will commit to introducing a care professional focused 'digital health and care skills programme' to support the introduction of digital technologies in the health and care sector (during 2018)

4.10.2 Patients, Service-users and the public

For patients, service-users and the general public we cannot necessarily offer the same kind of direct support, but through partnerships with, say, Barclays Digital Eagles[63], and others, a range of digital skills training could be made available publicly.

63 http://www.barclays.co.uk/DigitalEagles/P1242671738729

As Jersey is also in the midst of digitising government with the eGov programme, we think it would be beneficial to undertake public digital skills improvement in collaboration with that programme, so that improvements in public perception of, and ability to use digital technologies are relevant to all digitally enabled services on the Island.



Commitment 27: We explore partnerships with 3rd parties to develop public facing digital skills training and support programmes, aligned with introduction of the major elements of this strategy e.g.JCR, online portal (by June 2017)

4.11 Importance of Local Capability

There is no getting away from the fact that Jersey is an island, and because of this, there is a limited pool of resources and capabilities from which to draw. This is especially true in the realm of health and care systems and technologies, where there isn't a strong local development community building health/care systems; most of the systems implemented in Jersey are international products such as TrakCare, EMIS, CarePartner et al.

This is likely to continue to be the case as Jersey seeks to introduce 'best in class' systems into the local health and care landscape and the commercial developers will continue to evolve their products to meet market demands around the world.

Where this does become a significant issue is in two main areas:

- **Jersey isn't a big enough customer:** for an international product company, the Jersey health and care market is small, and is therefore always going to lower down the list. If a supplier's product needs to be customised to support Jersey-specific requirements, then that is either going to cost a

lot more money, or be at the back of a very long queue of other customer requirements.

- **Integration requires local knowledge:** to support joined-up care, this strategy requires many different systems to be integrated into an inter-operable network capable of moving data between organisations, and into and out of the JCR. That requires specific local knowledge about care processes, and the capability to work with the integration technologies to join everything up to match those processes. The commercial companies providing the core products do of course have those capabilities, but they are very much in demand elsewhere as other health systems drive towards better integration themselves.

The big challenge for Jersey is to keep our requirements high enough up the agenda for commercial companies to take note, and to ensure that there is continual access to the integration expertise needed to join everything together, and to sustain that as the integrated landscape evolves.

We believe that the best way of protecting Jersey's interests is to ensure that there is strong involvement of companies operating in the island ("local firms") in the delivery of this strategy; fostering commercial partnerships between these companies and international companies blends the best of both worlds – best in class products, integrated into the local landscape with local knowledge and support available locally.

Commitment 28: We will foster relationships between local firms and international companies to ensure that Jersey develops the skills and capabilities to implement this strategy, and to influence the shape of third party product development in the interests of Jersey (by March 2017)

There is also another important dimension to 'local capability' - innovation. Jersey is an island of natural innovators; it has a strong history and a culture of innovation. It is one of the reasons it is an internationally recognised financial centre, simply because it innovated and seized the opportunity before others.

We would like to capitalise on this natural culture of innovation, for the benefit of the health and care sector. Having relevant local, technical capability and partnerships with international companies is part of the picture, but we also need ways to harness local innovations which may be beneficial.

Planning a series of 'demonstrator projects' in key health / care areas is one way of focusing resources and efforts, and we have already identified a number of those in this strategy, but they need to be supported to ensure that they don't just 'fizzle-out'. We think the best way of doing this is to utilise Digital Jersey as the 'incubator / facilitator' for the demonstrator projects, as it is

consistent with their core purpose, and it would avoid these types of projects being 'crashed together' with the key deliverables such as JCR which need an absolute focus from the Health and Social Services Department, and wider government colleagues.

Commitment 29: Digital Jersey will act as the home for a number of identified digital 'demonstrator projects' to support their development and evaluation (formed during 2017, and ongoing afterwards)

As new ideas emerge that have potential benefits for health and care, Digital Jersey is well placed to encourage and support those ideas, and to broker the necessary government, commercial and technology relationships to progress them to the point where they could be included in the portfolio of 'demonstrator' projects, and ultimately if successful, into the health and care system itself.

4.12 Enduring Support

4.12.1 Coordinating Operational and Technical Support

Implementing this strategy across the health and care landscape creates a 'connected system' across the Island and as a result, builds a dependency on each and every other part of that system operating normally. For example, if one part of the system suddenly stops sending information to the JCR/Hub then information which might be critical for delivering safe and effective care would be missing.

We need to ensure that all parts of the 'connected system' are operating normally, and that requires the technology and service management teams responsible for each of the individual systems to coordinate their efforts to ensure that there are no outages, message transfer failures, no error reports etc. In the connected network of systems outlined in this strategy there will be some local components managed by in-house teams, e.g. TrakCare integration suite, managed by Information Services Directorate (ISD), some managed by third parties, e.g. GP Central Server, managed by EMIS, and some managed by combinations of the two. All have to operate to the same kinds of service management standards to ensure that the integrated 'connected system' works as intended.

As the individual resources for service management are tied to their own respective organisations, it makes it a bit more difficult to implement the approach across all parties. One way of solving this problem would be to put the resources into a common "shared services organisation" which then contracts

with each discrete organisation for an agreed set of services / performance levels.

There are advantages and disadvantages to this approach, not least gaining agreement from all organisations to release the resources for this purpose, aligning staff contracts / pay grades, sorting out governance arrangements etc. An alternative mechanism is to create a virtual organisation, comprised of the individuals from each organisation, and working to common service management standards. However, as before, there are some advantages and disadvantages to this approach too. Outsourcing the whole service management function is also an option, but again there are advantages and disadvantages that need to be considered.

Rather than commit to a particular approach at this moment in time, we think it prudent to investigate the alternatives and decide what will work best for Jersey (and potentially also across the Channel Islands). Colleagues from ISD, HSSD and representatives from EMIS, InterSystems and others will need to discuss and agree the most effective and workable mechanism for Jersey, and of course to identify and secure any funds necessary for providing this kind of support on an enduring basis.

Commitment 30: We will look at options for providing a coordinated service management approach to all of the 'connected systems' introduced as part of this strategy, with the intention of implementing one of those options alongside the systems described in this strategy (during 2017)

4.13 Business Change

4.13.1 Changing Processes

This strategy sets out an ambitious programme which will enable Jersey to embrace digital technologies throughout the health and care system. The technological solutions set out in the document create new possibilities for delivering health and care services in different ways, as well as providing better support to existing health and care to improve quality, efficiency and outcome.

We have already mentioned the importance of ensuring that care professionals are suitably skilled in using those new technologies to maximise the potential, and increasing the general digital capability of the population in parallel with introduction of key online resources e.g. portal. But we must also ensure that sufficient attention is paid to the 'business change' aspects of delivering this programme of work. Without effort to engineer and support process change, there is a substantial risk that any technological change will not exploited

effectively, and worse, could create operational difficulty as 'old process' is squeezed into 'new systems'.

We have seen this type of thing many times in badly executed system implementations; here we are attempting to coordinate multiple concurrent system implementations / integrations across the whole health and care landscape, so our risks are significantly higher.

To manage and mitigate these risks, we will ensure that every project and activity required by this strategy is supported by sufficiently skilled 'business change' personnel, who will work with colleagues across the sector to smooth the path of implementation, and ensure that we have the best possible chance of achieving the proposed benefits of this strategy.

Commitment 31: We will ensure that every project has 'business change' as part of its planned and budgeted remit, to mitigate the risks of technology-led implementations.

5. Roadmap & Governance

5.1 The Critical Components

This strategy has set out several key components which together will enable Jersey to exploit technologies for the benefit of patients, service-users and care professionals alike. To summarise:

- Ensuring that each part of the health and care infrastructure has a core patient / service-user records-keeping and administration system in place, which meets basic 'maturity' levels and supports 'open standards'
- Implementing a universal identifier for all persons, based around the "People Directory", and integrating that into electronic systems, interfaces and interchanges between all parts of the health and care landscape
- Implementing a Jersey Care Record; a universal online record of patient and service-user interactions with health and care organisations, and a 'hub' for implementing cross-sector 'business logic' such as 'safety alerting', all accessible through a single public-facing portal
- Creating electronic care plans, closely coupled with Jersey Care Record, so that all care professionals, and patients/service-users have access to that information, wherever they are

- Supporting electronic pathways of care, in combination with online digital care records, electronic care plans, and intelligent use of data to monitor compliance
- Facilitating much more effective care professional to care professional communication with technology
- Creating a repository of health and care data, and using a combination of human and machine driven analysis, improve how care is planned, delivered and managed
- Developing the digital competence of care professionals, so that they can exploit digital technologies effectively
- Promoting health and care research, development and innovation via several demonstrator projects to exploit the potential of systems and data

The outline roadmap of key activities is included at Annexe I

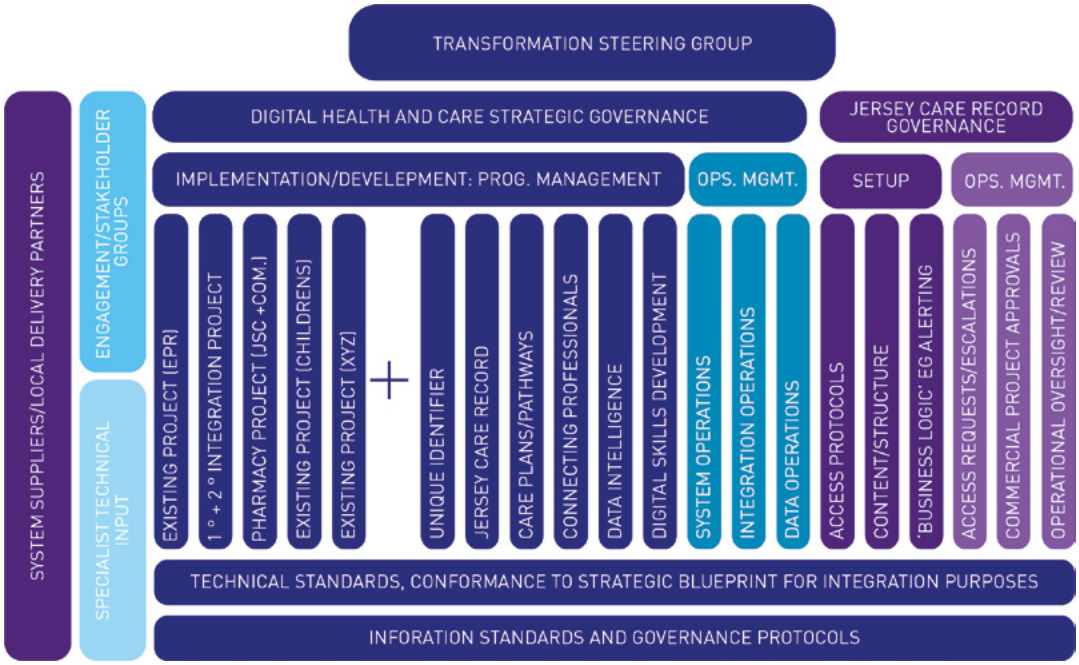
5.2 Managing Delivery

To keep these individual activity streams under control and working towards the overall objective it will need strong oversight and governance from HSSD. This 'delivery portfolio' will also need specialist input and guidance from technical, clinical, care and operational professionals throughout. It is likely therefore that several topic specific stakeholder / delivery groups will be formed to help deliver this portfolio.

There are also some projects that are within the scope of this strategy, but which are not within the governance of HSSD that will also need to align for the whole sector to join up in the manner envisaged in this strategy, for example the implementation of EMIS in FNHC and Hospice.

To this end, the technical 'standards' and 'blueprints' following on from this strategy will be actively promoted with colleagues in other organisations, and support will be available to help them steer their own projects towards the overall vision. If it proves necessary, we may also consider establishing a dedicated 'integration portfolio' programme board to support coordinated delivery across the sector.

As the Jersey Care Record evolves it will also reach a point where it becomes an operational entity, and moves from 'delivery governance' to 'operational governance'. As we indicated earlier we believe the JCR will need its own governance function to oversee aspects such as content, access protocols, escalations, commercial requests, and transparent audit/review, to maintain confidence that the service is operating legally and in the best interests of patients/service-users.



The technical 'standards' and 'blueprints' developed following this strategy will be used to guide and shape individual projects as they are delivered; the intention is that each project adds some key components to the overall jigsaw picture, for subsequent projects to utilise, and thereby cumulatively reach the integration goal. For example, the primary to secondary integration project (results, order comms) would be expected to implement common components such as messaging engine, person-identity service, results viewers etc. These components would then be re-used by subsequent projects such as JCR, or pathways.

Keeping this type of cumulative approach running consistently across successive projects and activities, and across multiple stakeholders, is business critical and we consider it important that sufficient resources and focus are applied to delivering this strategy, including programme and project management and a role acting as 'Chief Information Officer' for Health and Social Care across the island.

5.3 Measuring Success

The measures of success for this strategy are set out as follows:

AREA	MEASURE
Core Records Systems	Each care domain has a competent records system in place (according to agreed maturity framework): • Primary • Secondary (multiple depts.) • Ambulance / Emergency • Childrens Services • Mental Health • Adult Social Care • Pharmacy (incl retail) • Community • Family Nursing • Hospice • Care Homes (to be confirmed)
Universal Identifiers	• Unique person reference numbers are used in all order communications between primary and secondary care • Unique identifier included as 'alias' in TrakCare and EMIS for > 90% of interchanges
Jersey Care Record	• JCR in situ, with event information from primary and secondary care (to agreed definitions) • Portal Access for patients and professionals • At least 3 functional service/apps present in the portal e.g.book service, contact care professional • At least 3 IoT/wearable demonstrator projects completed, and at least 1 implemented in practice
Care Plans	• Each person in JCR to have at least one active care plan available
Care Pathways	• Each person in JCR to have at least one active pathway available in JCR
Connecting Professionals	• Directory of professionals in place • Primary and secondary clinicians are actively communicating using the mechanism (>50 contacts /actions per week using this approach)
Data and Intelligence	• More than 80% of health and care analysis is conducted on the data platform • At least 3 demonstrator projects completed, and at least 1 implemented in practice • Analytical network active, and evidence of collective working on key analytical questions
Digital Skills	• More than 1000 people have taken-up the 'public' digital skills programme • More than 150 care professionals passed through the 'professional' digital skills programme

6 Resources

6.1 Funding Envelope

To be clear at the outset, there is no 'new money' for this work; the funding approved as part of P82[64] and the Medium Term Financial Plans (MTFP[65]) is the envelope that we must operate within.

If delivered in isolation the costs of developing an integrated care record are in the range of £500k to £1.75m (based on a rough assessment of business cases for similar work done elsewhere in England).

However, we can minimise this by adopting an approach of 'cumulative'' delivery, and coordinating each project to align with the intentions of this strategy, we can ensure that any monies spent on individual projects also deliver a 'plus one' benefit for subsequent projects to use.

For example, the Primary to Secondary integration project (test request/ results, imaging) will implement common components such as messaging engine, person-identity service, results viewers etc. which are the essence of the 'Hub' described earlier in this document.

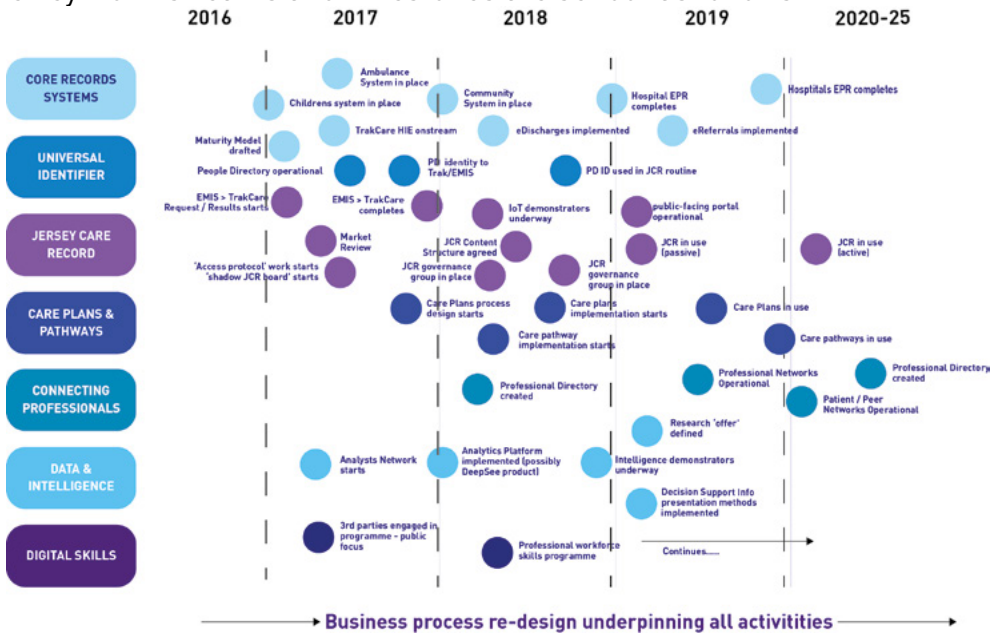
Subsequent projects will re-use these components, for example the implementation of care plans or pathways in the JCR, and will in turn add their own 'plus one' to the overall set of components and services.

Projects already underway and planned will play a major part in delivering key elements of this strategy. Our expectation is that the existing funding envelope for planned projects over the next 3 - 5 years can be used in a way that delivers these planned projects and enables them to be part of the overall end vision described in this paper within existing budgets.

64 http://www.statesassembly.gov.je/AssemblyPropositions/2012/P.082-2012.pdf
65 http://www.gov.je/Government/PlanningPerformance/StrategicPlanning/Pages/StatesAnnualBusinessPlan.aspx

Annexe I – Road Map and High-Level Benefits

The key work-streams and milestones are set out as follows:



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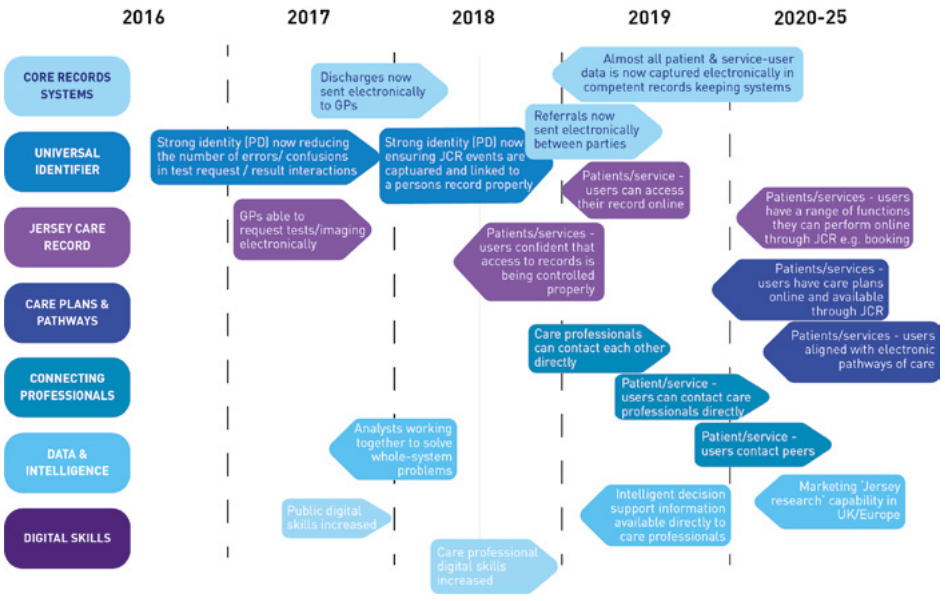

Annexe II – Priority Areas Grid

The following matrix is a very rudimentary largely unscientific assessment of priority areas, based on scoring a number of factors; volume of activity, safety/risk score, potential efficiencies, and a user perceived value score. Those services which have the highest overall score are the ones where we should ensure there are adequate records and administration systems in place to underpin the 'integrated health and care system'

Care Domain	Volume Score	Safety/Risk Score	Efficiency Score	User Value Score	Overall Score
Primary care					
General Consulations	8	6	6	8	28
OOH	4	7	5	8	24
Test request/results	8	7	8	8	31
Secondary (multiple depts.)					
Emergency	5	8	6	9	28
Maternity	5	7	6	6	24
Imaging	6	6	7	5	24
Labs (internal)	8	7	8	5	28
Pharmacy	8	8	6	7	29
Ambulance/Emergency	5	8	7	8	28
Childrens Services	2	8	6	7	23
Mental Health	3	7	6	7	23
Adult Social Care	6	4	7	7	24
Pharmacy (retail)	7	6	6	4	23
Community	6	4	7	7	23
Family Nursing	7	4	7	6	24
Hospice	2	3	4	7	16
Care Homes	2	3	4	7	16
Safeguarding (in any setting)	2	10	7	10	29

Annexe III – Vision, Ambition and Principles

The document can be found at **www.digital.je/digitalhealth**

Annexe IV – List of Stakeholders

The following people have been involved with Digital Jersey over the last six months in various workshops and activities to advance health and care technology, and more recently a number of these stakeholders have been directly involved in developing this digital strategy:

Name	Surname	Organisation	Title
Stephen	Atherley	HSSD	Programme Manager
Danny	Bannister	TSGi	CEO
Peter	Bates	HSSD	Consultant Physician
Sian	Baudains	CI Cooperative	GP
Jill	Birbeck	HSSD	
Russell	Blake	HSSD	Project Manager
Adrian	Blampied	FNHC	Finance Director
Paul	Blampied	C5	Data Scientist
Angela	Body	4Health	CEO
Ben	Bryans	HSSD	
Chris	Clark	Prosperity 247	CEO
Ian	Dyer	Adult Mental Health Services	
Nathalie	Cross	CI Cooperative	Head of care
Craig	Culkin	HealthHaus	Manager
Philippa	Daubeney	Primary Care Body	GP
Sophia	de la Haye	HSSD	
Andy	Delaney	C5	Health Lead
Andy	Dentten	Jersey Hospice	
Joe	Dickinson	Jersey Post	Special Projects Manager
Sue	Duhamel	SoJ	Soc Sec
Chris	Dunne	HSSD	
Beverley	Edwards	HSSD	Head of Informatics
John	Gambles	Altius/C5	Data Scientist
Peter	Gavey		Head of Ambulance Service
Jaqueline	Gillies	Law Offices Department	
Ian	Goddard	Infrasofttech	Head of Crown Dependencies
Sam	Goulding	SoJ	ISD
Tony	Hall	SoJ	Procurement Manager
Andrew	Heaven	HSSD	

Clare	Hogg	HSSD	Application Support Manager
Jim	Hopley	Voluntary Community Sector	
Matt	Johnson	LV Care	Pharmacist
Sam	L'Empriere	HSSD	
Will	Lakeman	SoJ	Policy Principal
Gailina	Liew	Digital Jersey	NED
Eliot	Lincoln	Greenlight	CEO
Mark	Loane	C5	CEO
Ricky	Magalhaes	Logicalis	Head of Offshore Security
Emma	Martins	DP	Data Protection Commissioner
Paul	McCabe	HSSD	Head Pharmacist
Daragh	McDermott	JTGlobal	Corporate Affairs Director
Nigel	Minihane	Primary Care Body	Lead GP
Andy	Mitchell	HSSD	Consultant Cardiologist
John	Moore	HealthHaus	Manager
William	Murphy	JTGlobal	Government Programme Director
Colm	Norton	TSGi	Regional Manager
Helen	O'Shea	HSSD	Hospital Director
Paul	Patterson	ISD	
Bryany	Perchard	HealthPlus	GP
Sebastien	Perez	HSSD	Primary Care Integration
Kerry	Petulla	Donna Annand Charity	Chair
Steve	Powell	ASE	
Graham	Prince	HSSD	Lead Clinician
Daniela	Raffio	HSSD	Primary Care Integration
Mark	Richard-dit-Leschery	SoJ	Service Desk Manager
Glenda	Rivoallan	HealthHaus	Owner
Emelita	Robbins	Jersey Hospice	CEO
Matthew	Robins	Webreality	CEO
Phil	Romeril	CI Coop Pharmacy	Lead Community Pharmacist
Phil	Ruelle	Greenlight	CTO
Manuel	Saenz	SoJ	eGov PM
Becky	Sherrington	HSSD	System Redesign & Delivery Manager

Chris	Shield	Marbral	PM (working with FNHC on EMIS roll-out)
Siim	Sikkut	Estonian Govt.	Digital Advisor
Martin	Siodlak	HSSD	Medical Director
Julian	Slater	Prosperity 247	
Gary	Stewart	C5	
Sam	Sugden	Social Security Department	
Jeff	Tate	SoJ	Head of IT (HSS)
Jason	Turner	HSSD	Director of Finance and Information
Ian	Webb	SoJ	ISD Director
Sarah	Whiteman	HSSD	GP & Medical Director
Bronwen	Whittaker	HSSD	
Jonathan	Williams	SoJ	eGov Director
Rachel	Williams	HSSD	System Redesign & Delivery Director
Tom	Witherington	Webreality	CTO
John	Woodhouse	TSGi	CTO
Ian	Wright	Jersey Medical Science Association	

Jersey Medical Science Association

Annexe V – Key Commitments Summary

This strategy makes thirty commitments overall, and they are summarised here for reference:

Commitment	Timetable
Commitment 1: This strategy requires every part of the health and care system to implement electronic record systems that are capable of capturing and sharing structured information electronically with other parts of the health and care system	End 2019
Commitment 2: To ensure that all digital records are consistent with a common standard, Jersey will create a common record architecture and data dictionary which will be applied in all system implementations, and integration activities	December 2017

Commitment 3: Jersey will develop a whole-system 'maturity model' approach to managing the incremental improvements to every digital / records system to ensure that meaningful interoperability is achieved for the major clinical / care interactions between parties, e.g.results, referrals, medications updates	End March 2017
Commitment 4: We will explore the use of the "People Directory" to provide identification services across all health and care interchanges, to increase the accuracy of matching records across systems and services (by December 2017, for test request/results, and by early Q2 2018 for JCR record population)	by December 2017, for test request/ results, and by early Q2 2018 for JCR record population
Commitment 5: We will commit to the creation of a Jersey Care Record that is a comprehensive repository of real-time individual health and care system interactions, using common industry standards, and to an agreed content structure determined by Jersey care professionals	End of 2025 (complete)
Commitment 6: We will implement a care plan and care pathway management capability alongside the Jersey Care Record, so that all care professionals have access to current plan/pathway information, and patients can set preferences for resuscitation, preferred place of death etc	Between 2020 and 2025
Commitment 7: We will implement a 'hub' model as the logical mechanism for linking together data and systems and interchanging health and care data	During 2017
Commitment 8: The JCR will enable any actions carried out directly online, to be integrated into care professional regular systems, to ensure that we make the most use of safety / better care logic built into local systems	December 2022
Commitment 9: Jersey is committed allowing access patients and service-users to access, and ultimately interact with the JCR, for sharing / restriction, holding care preferences, and undertaking health / care actions, according to clear, well defined access and governance protocols that work in the best interests of patients / service-users at all times	December 2022
Commitment 10: Jersey will capitalise on the potential of JCR to drive improvements in health and care for its residents, using 'smart' data techniques such as machine learning (during 2018/19)	During 2018

Commitment 11: We will create a Jersey Care Records Board (JCRB) to oversee protocols for accessing the JCR, and to ensure that the JCR is exploited in a safe and secure manner, in the best interests of patients and service users	During 2018
Commitment 12: All care professionals contributions to JCR will be their professional responsibility, and their contributions will be explicitly identified in the JCR, so that other care professionals, patients and service users are able to consider the validity and relevance of that information in context	During 2018
Commitment 13: We will put in place online, curated information resources which help patients and services users understand their condition / situation better	During 2018
Commitment 14: We will expand the Jersey Online Directory to include details of all services that could be consumed by patients and service users, in an easy to use, understandable and accessible directory, and in a way that provides a direct bridge into those services to be able to access them, rather than simply an address book of locations	During 2018
Commitment 15: We will ensure that there are a number of useful 'transactional services' linked to each of the elements in the Service Directory, so that patients and service-users can book, schedule, or otherwise access those services from the one portal	During 2018
Commitment 16: We will create a Jersey care professionals directory which includes all of the essential contact details for everyone working in Jersey (and potentially with partners in Southampton, London and Oxford)	During 2017/18
Commitment 17: We will put in place a secure messaging/contact infrastructure which supports person-to-person connections between care professionals across Jersey and with partners off-island.	During 2019
Commitment 18: We will pilot a 'patients like me' approach to connecting patients and service-users with others, and evaluate the benefits prior to any formal inclusion in the health and care service directory	Between 2020 and 2022
Commitment 19: Enable key systems to be 'portable' by 'web' or 'App' enabling them, through the use of standard Open interfacing / API techniques.	During 2017

Commitment 20: Working with procurement colleagues, specify Open / API standards for all new systems so that they are more readily integrated into the landscape, and can be deployed through portals, Apps and other such	During 2017
Commitment 21: We will design the JCR and the associated 'hub' services in such a way that could accommodate future inclusion of IoT generated data alongside care records. We will undertake a number of small 'demonstrator projects' to test out the techniques for collection / integration, and help us establish the protocols for handling such data	During 2018
Commitment 22: As the JCR is implemented, we will begin to formulate the 'research offer' and share this with colleagues in academia to stimulate interest in Jersey-based health and care research	During 2018/19
Commitment 23: To explore the potential of machine learning and its practical application in health and care, we will undertake a series of research / demonstrator activities in collaboration with industry subject matter experts. (During 2018)	During 2018/19
Commitment 24: We will create a professional analytical network to foster collaborative working on data and intelligence across the health and care system	By March 2017
Commitment 25: Working with care professionals across the health and care system, we will investigate the most effective way of providing effective decision support to help make better, safer decisions	During 2017
Commitment 26: We will commit to introducing a 'digital health and care skills programme' to support the introduction of digital technologies in the health and care sector	During 2018/19
Commitment 27: We explore partnerships with 3rd parties to develop public facing digital skills training and support programmes, aligned with introduction of the major elements of this strategy e.g.JCR, online portal	By June 2017
Commitment 28: We will foster relationships between local firms and international companies to ensure that Jersey develops the skills and capabilities to implement this strategy, and to influence the shape of third party product development in the interests of Jersey	By March 2017

Commitment 29: Digital Jersey will act as the home for a number of identified digital 'demonstrator projects' to support their development and evaluation	Formed during 2017, then ongoing afterwards
Commitment 30: We will look at options for providing a coordinated service management approach to all of the 'connected systems' introduced as part of this strategy, with the intention of implementing one of those options alongside the systems described in this strategy	During 2017
Commitment 31: We will ensure that every project has 'business change' as part of its planned and budgeted remit, to mitigate the risks of technology-led implementations.	ongoing