## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Summary</td>
<td>1</td>
</tr>
<tr>
<td>Introduction to Queensland Health ICT</td>
<td>6</td>
</tr>
<tr>
<td>Interviews and research on global best practices</td>
<td>8</td>
</tr>
<tr>
<td>Recommendations</td>
<td>15</td>
</tr>
<tr>
<td>Roadmap and immediate priorities</td>
<td>34</td>
</tr>
<tr>
<td>Appendix A – best-practice examples of ICT capabilities</td>
<td>37</td>
</tr>
</tbody>
</table>
Executive Summary

CONTEXT
The current state of the Australian health system is unsustainable with issues including an ageing population, chronic diseases, over reliance on costly hospital settings and geographical isolation. Throughout the world healthcare is shifting its model from a point-of-care service delivery focus to patient centric, accountable health management. This presents Queensland Health with some specific challenges:

- Demand for highly consumer-focused health service e.g., improved integration of services across the health continuum as consumers age, move from rural and remote areas to metropolitan areas, or between public and private sectors
- Requirement to engage the community / healthcare stakeholders e.g., improve service linkages in the community and ease the transition between services and settings for consumers and their carers
- The need to provide cost effective, safe and evidence based service delivery across the entire state e.g., focussing on prevention, health promotion, early detection, screening and early intervention in rural areas
- Necessity to bridge the gap between communities e.g., substantial differences in health status and life expectancy between Aboriginal and Torres Strait Islander peoples and other Queenslanders
- Accountability in ‘grants’ to maximise service delivery – establishing clear links between funded ventures and health goals
- Ensuring alignment between various healthcare system stakeholders e.g., potentially different strategic approaches between the Department of Health at the centre and Hospital and Health Services (HHSs) at the local level.

Queensland Health has entered an exciting era of opportunity to improve health services to the community of Queensland. Headlined by the devolution of authority to 16 Hospital and Health Services and changes to the Department as System Manager and the two associated Business Units, Queensland has outperformed most other states in the key areas of emergency access, elective surgery access and budget surplus generation in the last 18 months.

Globally, flexible and responsive ICT system and capabilities are proving to be a key enabler in overcoming some of the challenges faced by health systems. The Queensland Government has defined its overarching whole-of-government ICT strategy (Queensland Government ICT Strategy 2013-17) that will shape ICT decision making, investment and governance into the future in support of two objectives:

- **Effective digital services for our clients** – improving customer experience, increasing development / adoption of digital technology and services, and increasing secure sharing and access to information to support improvement in quality and productivity
- **Effective digital services for government** – ensuring contestability for ICT services (supported by strategic sourcing, moving to ICT as-a-service and supporting greater levels of innovation – supported by a capable workforce and best-practice initiative delivery competency).

In the current environment, Queensland Health ICT operations and investments remain largely centrally driven. There is increasing frustration from HHSs and related Queensland Health leaders that Queensland Health ICT is falling behind best practice and being constrained from more directly enabling QH / HHS strategies and operating plans.
Queensland Health needs to shift to support clear ownership of ICT investment and outcomes to HHSs by devolving significant accountability for ICT decision making and fund holding to HHSs, whilst implementing levers and incentives to ensure (a) sufficient coordination in meeting overall Queensland Health objectives, and (b) appropriate governance of ICT investments in alignment with Queensland Government investment and contestability guidelines.

McKinsey & Company has been requested to deliver a strategic ICT roadmap that defines principles to steer ICT investment, incorporating world best practice – including the supporting governance and operating model to enable a more devolved ICT environment.

QUEENSLAND HEALTH INTERVIEW FINDINGS

Our recommendations for the Queensland Health ICT Strategic Roadmap have been informed by five critical inputs: (1) a review of the draft Queensland Health ICT strategy; (2) extensive interviews of a large number of HHS and Queensland Health leaders; (3) interviews with leading ICT system / service providers; (4) input and feedback from the Queensland Health Strategic Advisory Committee; and (5) an investigation of three of the leading health systems around the world – Kaiser Permanente, New Zealand Ministry of Health, and the UK National Health System – to identify key lessons and insights that can be best applied to support the Queensland Health transformation.

Interviews were held with Queensland Health staff representing Hospital and Health Services, clinicians, Corporate Office Divisions, Health Services Information Agency (HSIA) and Health Services Support Agency (HSSA). They covered delivery of a variety of functional programs including health service delivery, policy creation, contestability, renewal initiatives and infrastructure building.

The interviews focussed on three main areas: (1) current delivery of ICT, (2) challenges facing the health system and how it should operate in a 5 to 10 year horizon, and (3) an assessment of the behaviours and mindsets that need to change. The key message for each of these areas is as follows:

- **Current status** – the majority view is that the current system is broken with ICT seen as an impediment to good practice (clinical and business), poor delivery, high costs and limited customer service

- **Future challenges** – there is a lack of alignment on the challenges facing the health system and the way in which the system will need to fundamentally change to meet these challenges

- **Mindsets and behaviours** – the majority feel that the ICT system needs to radically change its focus to delivery and outcomes rather than process and risk aversion

In addition to the key messages above, there was an acknowledgement that HSIA has achieved good outcomes on a number of fronts, such as:

- There is a legally safe environment through ensuring security of Queensland Health data and confidentiality of patient records

- Clinical integration exists through introduction of ‘viewer’ software

- Hardware is well maintained

- A wide suite of state-wide architectures has been developed e.g., email access by any Queensland Health employee in any Queensland hospital

- Program management processes are in place.
RECOMMENDATIONS

Queensland Health ICT can better meet HHS needs and serve the overall Queensland Health system objectives through four broad recommendations:

- **Strategy: new ICT strategy to work in a more devolved model and directly enable business strategy**
  Shift the strategic framing of ICT to more directly link ICT requirements and capabilities to how they enable QH / HHS strategies and operating plans:
  - Implement a new ICT strategic framework – drive ICT principles and capabilities to directly enable health service capabilities and in turn Queensland Health strategic objectives
  - Define new decision making criteria to govern ICT investments in a more devolved model – creating flexibility to support alternate solution options, including an as-a-service approach, and a more targeted role for central support
  - Shift overall ICT approach to that of “enabling” HHSs to deliver health services and outcomes, and reflect this across the ICT value chain and related decision making

- **Large projects: business not ICT projects, with a co-design approach as a new way of working**
  Ensure effective prioritisation and HHS ownership of large ICT projects in direct support of target HHS outcomes:
  - Adopt a co-design process across ICT strategic priorities, solution options and vendor selection, working in partnership with HHSs and with input from expert advisors / partners
  - Ensure all ICT projects are part of bigger HHS business projects and link to HHS strategic plans
  - Ensure all projects have a business owner(s) accountable for the whole project – business case through to benefits realisation
  - Shift the role of the centre to that of enabling HHSs to deliver large projects leveraging central capabilities, whilst ensuring minimum architecture, security and integration standards are being met
  - Hold project funds centrally for the time being, and allocate through the ICT Strategy Board for large projects (note: large capital projects will still go through the current escalation / review process and the CBRC)

- **Operations: focused on HHS enablement and empowerment**
  Gradually shift local operational ICT decision making and related ICT services operating budget to HHSs, leaving centralised ICT infrastructure and accountabilities (i.e., information exchange backbone, security and data services) to be owned by the central ICT group. To support this transition we recommend setting up a process, jointly owned by HHSs and Queensland Health, to ensure structured handover of operating accountabilities and due consideration of contestability options:
  - Transition ICT operating accountabilities to HHSs, together with the required capability development and support funding – following a collaborative and structured process to set priorities, identify contestability options and support the transition (e.g., similar to the current IR process being run with HHSs)
  - Build HHS ownership and accountability for ICT operations through a stronger outcomes orientation
Ensure central accountability for core ICT infrastructure – such as information exchange backbone, security and data services (to be centrally facilitated and optimised, and delivered as a service to enable HHSs)

This transition needs to be managed in a way that:

- Maintains operational integrity
- Supports development of related / pre-requisite HHS capabilities and dependencies
- Considers and captures value from coordination and/or procurement across multiple HHSs (e.g., supporting HHS partnerships or a stronger role of central ICT for selected systems / services)
- Continues to enable system-wide requirements e.g., information access / availability
- Leverages lessons from similar processes to devolve accountabilities, assets and people

**Governance and operating model: new governance, new structure and new appointments to key roles**

Establish a new governance structure to support (a) alignment, partnership and prioritisation between the Queensland Health Department and HHSs, and (b) a stronger focus on strategy, architecture, standards and information management by the centre. This should be supported by a set of enabling capabilities across Queensland Health and HHSs, as well as an improved approach for innovation and strategic partnerships:

- Establish a new governance committee – the ICT Strategy Board (ISB) – to oversee strategy definition, architecture / standards, portfolio management (including demand management), benefits realisation and large projects (represented by HHSs, leading clinicians and independent advisors)
- Refocus the ICT Portfolio Board to govern operations, project delivery and core infrastructure, increase HHS representation to >50% and rename the committee to the ICT Program Board
- Appoint new Chief Health Information Officer (CHIO) to lead the strategic ICT central group – covering strategy, architecture / standards, information and knowledge management, clinical informatics, portfolio management and benefits realisation
- Re-focus HSIA on core / central ICT operations and project delivery, and change the current CIO role to Chief Technology Officer (CTO) – with the CHIO organisation taking on more strategic accountabilities and HHSs picking up greater ICT operations accountabilities
- Appoint an interim Transition Executive Director to oversee the transition of ICT accountabilities to HHSs, providing support for interim governance and HHS capability development
- Develop central capability to support HHSs – strategy and architecture, portfolio management (including business case development, demand management and resource management), strategic partnerships and procurement, vendor management, program management, information and integration management
- Create focus and structured support for innovation across all phases of the ICT value chain, and implement incentives for innovation creation and dissemination

Making meaningful change quickly will be critical to rebuilding HHS ownership of Queensland Health ICT and addressing immediate issues. In this regard, we recommend a number of changes to be made in the first 60 to 90 days:
Establish a baseline for a more devolved health ecosystem:

- Form the new ICT Strategy Board (to be potentially represented in the interim by the Strategic Advisory Committee)
- Change the charter and composition of the ICT Portfolio Board and rename it to the ICT Program Board – focus more on operations and project delivery, and increase HHS representation
- Initiate an architecture definition project, with ICT Strategy Board oversight, to define the enterprise architecture that will support a devolved ecosystem and greater solution/vendor flexibility (note: seek external support and expertise to complete this project)
- Announce the new CHIO role and structure, and start the recruitment process

Initiate process to transition operational accountability and budgets for ICT to HHSs. Appoint a Transition Executive Director to lead the work with oversight and steering provided by the ICT Program Board

Initiate a co-design process and set priorities with HHSs – including commitment to jointly create the ICT action plan – with oversight by the new ICT Strategy Board. As first order of business, initiate a review of core ICT solutions based on agreed priorities (e.g., iEMR, PAS, FAMMIS).

Implementing the above recommendations requires close collaboration and alignment with HHSs across 4 critical components:

- **ICT strategic framework** (see Exhibits 6 and 7) – holistic structure to support ICT decision making and directly link ICT requirements to how they enable health services capabilities, and in-turn the overall strategic objectives and outcomes
- **Central ICT governance** (see Exhibit 20) – key central governance committees to support effective and collaborative decision making in a more devolved ecosystem, covering the whole ICT value chain
- **Long-term strategic roadmap** (see Exhibit 28) – integrated roadmap to be co-designed with HHSs to define objectives, health service priorities and ICT priorities across 3 phases:
  - Build foundations (1-2 years) – strong foundation to enable best-practice healthcare in a devolved ecosystem
  - Deliver coordinated, value-based care (2-5 years) – patient-centred and value-based care delivery pathways
  - Integrated end-to-end health management (5-10 years) – population health management, wellness and prevention
- **Short-term roadmap** (see Exhibit 29) – clear priorities and milestones to deliver meaningful change quickly, rebuild HHS ownership, and build momentum toward the longer term roadmap
Introduction to Queensland Health ICT

In the period prior to 2008, the hospital and community operational elements of Queensland Health were under the governance of three Area Health Services. Performance management of the Health Service Districts (HSD) was the principal responsibility of the Areas, with some Director-General level conversations attended by both the Area General Manager and the District Manager. The Areas developed metrics that included clinical output e.g., activity, surgery waiting times and financial outputs.

In a 2008 restructure, the three separate areas were dissolved and each of the Health Service District Chief Executive Officers subsequently reported directly to the Director-General. A deputy Director-General level position in system performance was created to support the Director-General in his routine performance conversations.

At the same time, the four Brisbane based Health Service Districts underwent a merger to create two metropolitan Districts. These were large entities, with both being twice as large as the next largest District. This resulted in Districts of equal standing but with significantly different characteristics including size, clinical capability, indigeneity and rurality. This disparity remains a feature of the current Hospital and Health Service profile.

Prior to July 1, 2012, ICT was for the most part under the direct control of a Division of the Corporate Office, the Information Division, led by a Chief Information Officer who was also a member of the Queensland Health Executive Management Team. The Information Division employed staff both centrally and in the regions. In addition, most Health Service Districts employed a small number of staff in their District Technology Service to manage smaller local issues. On July 1, 2012, the Information Division was renamed the Health Services Information Agency with essentially the same functions and staff.

There have been multiple versions of ICT Strategy in Queensland Health, most notably the two eHealth Strategies in the mid to late 2000’s. All of the strategies, including the draft strategy most recently released to HHS Chief Executives (CE’s) in late April to cover the period 2014-18, have been created in the context of a centre-led philosophy.

We have conducted a preliminary review of the more recent draft ICT strategy, with the additional context of supporting greater devolution of responsibilities to the HHSs. The preliminary findings from this review are outlined below.

- **What is covered in the draft ICT strategy:**
  - The draft strategy aims to be in alignment with the whole-of-government strategic ICT direction
  - ICT requirements cover different phases of care with stakeholder needs defined for each phase
  - The immediate strategic priorities with associated qualitative benefits are identified

- **What is less evident from the draft ICT strategy:**
  - Overall
    - Linkage of ICT capabilities to the consumer / HHS needs in order to meet specific system outcomes
    - Operating model and governance capabilities that will support the ICT strategy in enabling Queensland Health and HHSs in a devolved ecosystem
- Assessment of the maturity level of current ICT capabilities and related priorities for HHSs
- Definition of core ICT capabilities (e.g., information / data standards, architecture) that are needed to develop best practice devolved healthcare ecosystems

- From HHS perspective:
  - Ownership and accountability of HHSs for outcomes and benefits ICT will enable, and the valuation of benefits from the HHSs' point of view
  - Full engagement of HHSs in the overall investment prioritisation and delivery process
  - Key metrics and performance management for the ICT capabilities

- From end consumer perspective:
  - Availability of multiple digital channels to support consumer empowerment
  - Target outcomes for reducing wait times and improving remote access to health services
  - Integrated care across different pathways, proactive care and health management.
Interviews and research on global best practices

QUEENSLAND HEALTH INTERVIEWS

Interviews were held with Queensland Health staff representing Hospital and Health Services, clinicians, Corporate Office Divisions, HSIA and HSSA. They covered delivery of a variety of functional programs including health service delivery, policy creation, contestability, renewal initiatives and infrastructure building.

The interviews focussed on three main areas: (1) current delivery of ICT, (2) challenges facing the health system and how it should operate in a 5 to 10 year horizon, and (3) an assessment of the behaviours and mindsets that need to change. The key message for each of these areas is as follows:

- **Current status** – the majority view is that the current system is broken with ICT seen as an impediment to good practice (clinical and business), poor delivery, high costs and limited customer service
- **Future challenges** – there is a profound lack of understanding regarding the challenges of the health system and the way in which the system will need to fundamentally change to meet these challenges
- **Mindsets and behaviours** – the majority feel that the ICT system needs to radically change its focus to delivery and outcomes rather than process and risk aversion.

**Current status**

Key comments and illustrative quotes are provided in Exhibit 1.

The system is generally considered to be disconnected, not aligned and not driving in the same direction. Many of the HHS leaders are almost disdainful in their consideration of the current ICT capabilities and processes. Some are actively advocating complete autonomy from the central agencies in the delivery of ICT.

Of particular concern is the suggestion, which was mentioned multiple times, that ICT is an active impediment to successful clinical and non-clinical work. Examples were provided of multiple log-ins slowing down processes, old technology that was capable of basic interactions, risk procedures for non-clinical systems set at a level for clinical risk.

People frequently symbolised what they considered to be poor ICT through highlighting issues such as the current version of Internet Explorer and the lack of being able to use the functionality of Microsoft Link in Outlook.

Clinicians gave examples of how they work differently in the private and public sector because of different capability.

While not an internal Queensland Health interview, one of the Medicare Locals spoke about an innovative program to provide trusted general practitioners with access to the Queensland Health Viewer. According to the interview, the technology solution was secured, funding was secured and both parties were in agreement however the program did not proceed because of central obstruction. Interviewees felt that ICT should support innovation rather than be a blocker.

Interviewees also spoke consistently of a poor service culture from the central agency. The four groups of interviewees who were responsible for major infrastructure projects, all were able to articulate how this service level, in their opinion, had added significant costs to their projects.
EXHIBIT 1

What we heard during interviews

**Current status**

<table>
<thead>
<tr>
<th>Key comments</th>
<th>Sample quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>• HSIA could be more responsive to business needs</td>
<td><strong>ICT is an active impediment to clinical productivity</strong> Senior clinician</td>
</tr>
<tr>
<td>• Need to enhance meaningful customer relationship with HHS</td>
<td><strong>Email not integrated systems is used mostly to transfer clinical information</strong> Dept leader</td>
</tr>
<tr>
<td>• Technology should be upgraded – currently antiquated and out of date</td>
<td><strong>Without data we cannot judge efficiency and productivity</strong> HHS leader</td>
</tr>
<tr>
<td>• Need to address many manual workarounds that are covering for lack of integration</td>
<td><strong>HSIA is not for us – leave us out of it</strong> HHS leader</td>
</tr>
<tr>
<td>• Change mindset of ICT being seen as an impediment to productivity</td>
<td><strong>Healthcare is moving ahead of ICT – ICT should not be the impediment to good care and today it is</strong> Senior clinician</td>
</tr>
<tr>
<td>• ICT must be focused on patient care</td>
<td><strong>We are a manual business</strong> HHS leader</td>
</tr>
<tr>
<td>• Challenge to notion that centre can procure cheaper (e.g., they saved 25% using internal procurement of external provider cf HSIA quote)</td>
<td>We do not get business value from ICT services HHS leader</td>
</tr>
<tr>
<td>• Corporate and HHS requirements are vastly different and can be better served by moving away from a one-system (or one-size-fits-all) approach</td>
<td></td>
</tr>
</tbody>
</table>

**Sample quotes**

- We do not get business value from ICT services
- HSIA is not for us – leave us out of it
- Healthcare is moving ahead of ICT – ICT should not be the impediment to good care and today it is
- Without data we cannot judge efficiency and productivity
- We are a manual business
- ICT is an active impediment to clinical productivity
- Email not integrated systems is used mostly to transfer clinical information

**Future challenges**

Key comments and illustrative quotes are provided in Exhibit 2.

Comments regarding the near full attention to current issues and the corresponding lack of deep thinking about future challenges have previously been made. Interviewees highlighted that the system does not have a strong strategy for how it will manage sustainability, ageing population with chronic disease, push for integration and coordination of care, responding to consumer power and delivering improvements through transparency. There is a strong sense that ICT should be an enabler of meeting these challenges, but a clear roadmap for how this will occur is not top of mind.

Several groups mentioned the iEMR program which has strong support and is considered likely to be beneficial, but is designed to cover less than 10 major hospitals in the foreseeable future.

SOURCE: Queensland Health interviews
EXHIBIT 2

What we heard during interviews

Future challenges

<table>
<thead>
<tr>
<th>Key comments</th>
<th>Sample quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ There is a perception that 2 platform strategy (Cerner and SAP) is already agreed</td>
<td>I expect my information to be in the cloud, available to all, and work with providers who meets my business needs</td>
</tr>
<tr>
<td>▪ Improve insight into future trends, challenges, functionality and leadership</td>
<td>There will be a growing trend to buying services and not hardware and software</td>
</tr>
<tr>
<td>▪ The consumer will become owner of information</td>
<td>We need a federated model with clear interoperability requirements</td>
</tr>
<tr>
<td>▪ Software as a service should be the dominant operating model</td>
<td>Only a very small central ICT function required in future</td>
</tr>
<tr>
<td>▪ There will be increased use of mobility solutions for staff and patients (including tele-health and tele-monitoring)</td>
<td>The future consumer component will be explosive</td>
</tr>
<tr>
<td>▪ Need to be partnering with best of breed service providers, and using best of breed contracts</td>
<td>There is a much greater role for private sector in partnering in services delivery</td>
</tr>
</tbody>
</table>

SOURCE: Queensland Health interviews

Mindsets and behaviours

Key comments and illustrative quotes are provided in Exhibit 3.

Interviewees recognised that a dramatic degree of change is required, resulting in a significant shift in attitude.

The devolved nature of the Queensland system was consistently noted, along with the differences in functionality required of the various entities. Corporate functions and clinical functions are noted to be completely different, and a mindset that responded to this and provided for the business needs was requested.

Many interviewees spoke about control and the need to move to a paradigm of knowledge creation rather than risk aversion and control.
EXHIBIT 3

What we heard during interviews
Mindsets and behaviours

<table>
<thead>
<tr>
<th>Key comments</th>
<th>Sample quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Centralise unique resources and capabilities within a small team to</td>
<td>Change the obsession with holding onto information that belongs to someone else</td>
</tr>
<tr>
<td>support and enable HHS</td>
<td>Dept leader</td>
</tr>
<tr>
<td>▪ ICT seen as investment in system and care improvement</td>
<td>Use ICT as a tool to enable productivity and efficiency improvement</td>
</tr>
<tr>
<td>▪ Investment needs to be reflective of organisation need, differentiating</td>
<td>Privacy provisions will take a different focus and patients will expect to be</td>
</tr>
<tr>
<td>between HHS’</td>
<td>able to see their information</td>
</tr>
<tr>
<td>▪ Require more agility and flexibility of decision making to address</td>
<td>We will need to follow the Tesco model and examine consumer behaviour</td>
</tr>
<tr>
<td>evolving business needs</td>
<td>HHS leader</td>
</tr>
<tr>
<td>▪ Focus on delivery and outcomes rather than process and risk aversion</td>
<td>ICT should be embraced as an investment to improve quality and reduce cost</td>
</tr>
<tr>
<td>▪ Department becomes a facilitator vs. controller and provider</td>
<td>HHS leader</td>
</tr>
</tbody>
</table>

What we heard during interviews
Mindsets and behaviours

SOURCE: Queensland Health interviews

ICT VENDOR INTERVIEWS

As part of the review process we interviewed a number of global ICT providers (e.g., Epic, CSC and IBM Watson) to get their perspective on healthcare evolution over the next few years. The interviews focused on worldwide healthcare trends and the changes in the way health systems are partnering with ICT vendors to achieve system objectives.

Key insights from the interviews included:

- Healthcare trends
  - Healthcare is moving towards value-based care that will require organisations to be loosely coupled but tightly integrated across the continuum of care
  - Healthcare spending is moving towards outpatient settings with predicted (relative) decline in inpatients
  - Lack of integration between different care settings (e.g., siloed OR and ED leading to less transparency) is one of the key problems faced by healthcare systems
  - Managing patient data and integration of information across the health network is of increasing importance, and use of capabilities like Electronic Health Record has become a key enabler
  - The role of healthcare ICT will evolve to become a strategic integrator with enforcement of common standards and policies only when needed
Healthcare is becoming top priority for service providers due to increase in cost of care and the investments being made by health systems.

The next horizon of clinical decision support is in applying natural language algorithms to process large amounts of unstructured data to provide options to clinicians (particularly for complex or rare conditions), versus using the traditional pattern matching paradigm.

**ICT vendor partnerships**

- The focus should be on formulating long term and symbiotic partnerships with vendors, involving them early in the process (for example in capturing latest ideas / innovation to shape requirements).
- Selection of new systems should involve insights from other leading health networks and vendors – who have successfully achieved the target outcomes.
- The health systems should create key working groups to shape solution options and explore different models together with vendors, while evaluating systems to solve key challenges.
- There should be sufficient flexibility and incentives in vendor partnerships so that the vendors continue to provide better ways / solutions e.g., assurance regarding available funding and payment incentives for achieved outcomes (such as hospital bed day reductions).

**GLOBAL HEALTH SYSTEM LESSONS**

Three particular systems were examined in depth because of a considered similarity to the Australian system (in the case of New Zealand and the United Kingdom) or because of excellence in ICT delivery (in the case of Kaiser Permanente and New Zealand).

The New Zealand system is considered a good model for Queensland because the journey that Queensland has just begun mirrors that of the path that New Zealand has travelled over the last ten years. This relates principally to structure towards a devolved model of accountability and in ICT management from a poor performing system to a world leader. Of particular note in New Zealand is the lack of central fund holding, the generation of high level strategy by the Minister which is then interpreted by the national Health ICT Board and cascaded to District Health Boards, strong clinician leadership and the maintaining of a power of veto by the central agency.

Kaiser Permanente is an integrated system of separate regional systems that practice coordinated care. Kaiser is generally considered to have provided the world benchmark in terms of knowledge about patients through ICT and knowledge regarding the business considerations. End-to-end understanding of the patient journey is a feature of Kaiser. Of particular note in Kaiser is the integration of primary and secondary care through a shared record. The Kaiser journey has not been easy and they provide lessons regarding clinical leadership and ICT used to support innovative models of care.

The United Kingdom has been the inspiration for much of the devolution in Queensland, particularly around the performance management structures. Queensland has recently received a number of NHS trained managers into the role of HHS CE and they generally indicate that the UK model is far superior to that in Australia. The United Kingdom teaches us regarding the failure of large centrally driven ICT projects and the pragmatism of delivery of ICT systems at a local level where accountability, authority and opportunity lie locally.

These three systems have been compared across the domains of governance, structure and accountability, metrics and incentives, capabilities and culture. Detail is provided in Exhibit 4.
## Insights from global case examples on governance and operating model

**Governance processes**

- ICT strategic planning process – first through regional Prioritisation Action Committees (PACs) and then through KP PAC – also includes decisions on centralisation, investment, etc.

- Procurement Action Committee (PAC) – at central and regional level – driving all ICT decisions

- Central Health IT Board led by clinicians District Health Boards (DHBs) run regional ICT governance and decision making (which then provides input into central Health IT Board)

- Health and Social Care Information Centre (HSIC) – supplies central solutions

- Patient and Info Directorate – delivers central ICT needs

- Informatics Services Commissioning Group (ISCG) – info / analytics support

- GP System of Choice (GPSoC) – panel for compliant GP software

**Structure and accountabilities**

- Regular performance / outcomes reporting and benchmarking across the system

- Financial incentives to reward quality performance

- Standardised DHB performance measures and yearly targets – Transparency and benchmarking across NZ

- National health provider directory

- Core capabilities exist to enable integration and knowledge creation

- NHS Tech Fund – covers 95% of ICT investment for projects that meet defined criteria / standards (focused on hospitals)

- Active procurement model – partner selection and evaluation (e.g., alliances, contracting)

- NHS-choices – single patient portal for whole NHS

- Siemens communication network

- Active procurement model and governance capability (provided centrally)

**Matrix and incentives**

- KP HealthConnect – common EHR (Epic), with regional instances (integrates EHR, appointments, registration, billing)

- MyHealth Manager patient portal

- National health provider directory

- Careweight – provider app to pull together EHR for a patient based on National Health Index

- GP-2-GP patient record transfer system

- Central data repository / analytics

- Active procurement model – partner selection and evaluation (e.g., alliances, contracting)

- ICT / system strategy and longer-term planning

- NHS-choices – single patient portal for whole NHS

- Siemens communication network

- Active procurement model and governance capability (provided centrally)

**Capabilities**

- Regions retain full ownership of ICT

- Centre seen as collaborative and value-oriented in decision making

- Change management capability (e.g., vendor fairs, reviews, procurement best-practice guidelines)

- Centre enables networked decision making by establishing ‘framework’ agreements with qualified vendors

- Domain-specific software

- NHS-choices – single patient portal for whole NHS

- Siemens communication network

- Active procurement model and governance capability (provided centrally)

**Supporting capabilities**

- Advance procurement and vendor management capability (e.g., vendor fairs, reviews, procurement best-practice guidelines)

- Centre as a driver of bottom-up innovation and program drive combined with top-down strategy setting

- NHS-choices – single patient portal for whole NHS

- Siemens communication network

- Active procurement model and governance capability (provided centrally)

**Mindsets and behaviours (culture)**

- Centre as a driver of bottom-up innovation and program drive combined with top-down strategy setting

- NHS-choices – single patient portal for whole NHS

- Siemens communication network

- Active procurement model and governance capability (provided centrally)

Six key lessons were gathered from the review of these international systems:

1. **All three systems operate in a culture of bottom-up innovation and program drive combined with top-down strategy setting.** They each have a strong strategic and operational planning framework within a devolved model where the emphasis is on freedom for the regional groups to deliver services as they see fit, as long as they are undertaken within a broad framework.

2. **The funds reside within the regional entities** such that those who have the greatest skin in the game in terms of benefits realisation also have the ability to procure, own and manage the program.

3. **Major ICT projects must be delivered in partnership between the regional entity and the central authority.** The central authority retains ultimate budget control, usually through an approval process for financial accountability. The partnership model takes into account the needs of the broader organisation for outcomes such as interoperability and reducing costs through purchase at scale. It also acknowledges that ICT systems are clinical or business systems and as such are tools to assist in the delivery of local requirements, and therefore should be largely under the control of the local entities.

4. **Core capabilities exist to enable integration and knowledge creation** (architecture, infrastructure, standards and definitions). These common elements allow for diversity of systems and vendors to meet the needs of the different business models in the regions while allowing the creation of value through knowledge formation. These are designed and managed by the central body in conjunction with their regions.

5. **Procurement is achieved through cooperation with the vendor community** rather than in a tightly controlled tender arrangement. The nature of large scale ICT projects is such that they...
are complex projects during which the nature of the available ICT can alter dramatically. The leading systems reviewed do not practice a tender system where the procurer provides very prescriptive specifications against which the vendors tender. Rather, they use a partnership approach whereby the functional outputs of the system are articulated by the system owner and the collective wisdom and innovative skill of the market is captured in the procurement process.

6. **The central ICT organisation is small, has a high degree of capability** in certain areas and is uniformly seen by the regional areas as an enabler to their success. Typically the central agency has a unique capability in areas such as procurement and system architecture.

A final lesson arises from Kaiser alone, whose journey to world leading ICT capability has not been without some significant difficulties. Their lesson relates to creating system wide ICT solutions in the setting of diverse regions. They have learnt that a single solution across the system results in the solution being designed for the most complex and large organisations, and is therefore high cost and not fit-for-purpose for smaller organisations.
Recommendations

The recommendations detailed in this section have been informed by a large number of interviews (including HHS, Queensland Health, ICT providers and leading industry stakeholders), input from the Queensland Health Strategic Advisory Committee, and the study of lessons learned from leading health systems (such as Kaiser Permanente, New Zealand and NHS / UK). The recommendations detailed below are aligned with the broader Queensland Health objective of transferring greater accountability (and resources) to HHSs, and the defined Queensland Government ICT principles.

The recommendations for Queensland Health ICT are defined across four dimensions:

1. **ICT strategic framework:** shift the strategic framing of ICT to more directly link ICT requirements and capabilities to how they enable QH / HHS strategies and operating plans. In parallel to this, we recommend a new decision making criteria to govern ICT investments in a more devolved model – creating flexibility to support alternate solution options, including an as-a-service approach, and a more targeted role for the central groups based on supporting whole-of-system objectives.

2. **Large projects:** ensure effective prioritisation and HHS ownership of large ICT projects in direct support of target HHS outcomes.

3. **Operations:** gradually shift local operational ICT decision making and operating budget to HHSs, leaving centralised ICT infrastructure and accountabilities (i.e., information exchange backbone, security and data services) to be owned by the central ICT group. To support this transition we recommend setting up a process, jointly owned by HHSs and Queensland Health, to ensure structured handover of operating accountabilities.

4. **Governance and operating model:** establish a new governance structure to support (a) alignment, partnership and prioritisation between the Queensland Health Department and HHSs, and (b) a stronger focus on strategy, architecture, standards and information management by the centre. This should be supported by a set of enabling capabilities across Queensland Health and HHSs, as well as an improved approach for innovation and strategic partnerships.

Each of these dimensions has a set of detailed recommendations that are described below (see also Exhibit 5).
1. ICT STRATEGIC FRAMEWORK

1.1 Implement a new ICT strategic framework – drive ICT principles and capabilities to directly enable health service capabilities and in turn Queensland Health strategic objectives.

The alignment of ICT to Queensland Health outcomes and HHS strategic objectives can be represented across five distinct levels (see Exhibits 6 and 7).
ICT strategic framework aligns with outcomes and overall needs

Components of an ICT strategic framework

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
<th>Design principles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole-of-system principles</td>
<td>Overall Queensland Health principles and target outcomes/KPIs as defined in the Queensland Health Blueprint</td>
<td>Health services focused on patients and people, Empowering the community and our workforce, Providing Queenslanders with value in health services, Investing, innovating and planning for the future, Local decision making and strategy aligned with target outcomes</td>
</tr>
<tr>
<td>Strategic objectives</td>
<td>Multi-year Queensland Health strategic objectives as defined in the Queensland Health Strategic Plan, Aligns with Queensland Health Blueprint to drive strategic and operational planning across Queensland Health, and steer development of health service capabilities</td>
<td>Improve customer experience, Outward focus to facilitate improved stakeholder engagement, System-wide perspective on planning and capacity investment, Support change and flex to meet changing external and environmental factors, Active workforce engagement across all levels</td>
</tr>
<tr>
<td>Health service capabilities</td>
<td>Health service capabilities required to support the Queensland Health strategic objectives – focusing initially on the immediate ‘customers’ for Queensland Health ICT (consumers and business / HHSs), and ensuring whole-of-system linkages are supported</td>
<td>Enable a coordinated, secure and transparent ecosystem, Support open data across care setting and stakeholders, Enable decision making through health informatics, Balance benefits of a unified system and greater local autonomy, Culturability and ICT strategic sourcing, Encourage and enable innovation</td>
</tr>
<tr>
<td>ICT capabilities</td>
<td>Requirements criteria against each ICT requirement to facilitate decision making regarding ICT investments (including where the centre needs to be involved)</td>
<td>ICT as-a-service ICT requirements in order to support health service capabilities, ICT as-a-service ICT requirements in order to support health service capabilities</td>
</tr>
<tr>
<td>Governance and operating model</td>
<td>Required enabling governance, operating model (incl. structure, accountabilities, metrics and incentives, and capabilities) and culture (mindsets and behaviours) to support achievement of health system outcomes and needs, as well as creating greater levels of engagement and ownership</td>
<td>Consistent with commissioning process, Devolve as far as practically possible, Leverage enabling capabilities with accountability shifts, Simplified and streamlined structure that eliminates duplication of functions, improves process functionality and provides clear accountability</td>
</tr>
</tbody>
</table>

EXHIBIT 7

ICT strategic framework

Quality healthcare that Queenslanders value

Healthy Queenslanders – facilitate the integration of health system services that focus on keeping patients, people and communities well

Accessible services – ensure access to appropriate health services is simple, equitable and timely for all Queenslanders

Safe services – focus healthcare resources on models of care that are patient-centred, safe, effective, economically sustainable and responsive to community needs

Value for money – provide value in health services by maximising public investment in multi-sector partnerships in service delivery, health and medical research, infrastructure and assets

Governance and innovation – foster a health system that is transparent, accountable, and innovative

Partnerships and engagement – cultivate a high quality health system through positive engagement and cooperation with our workforce and health system partners

EXHIBIT 6

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health service capabilities</td>
<td>Operating capabilities to deliver efficient, effective, safe and coordinated health care across different steps of the care pathway</td>
</tr>
<tr>
<td>ICT capabilities</td>
<td>Interfaces - Digital service platforms, Mobile care delivery, e.g., telehealth, Integrated ecosystem, Operational - 360 degree view of consumers, Agile workforce management, Timely &amp; trusted clinical insights, Timely &amp; trusted operational insights, Business process efficiency</td>
</tr>
<tr>
<td>Enablers</td>
<td>Legislative and regulation - Operating model - organisation structure, processes, people / capabilities, Governance, accountabilities and cascaded performance management</td>
</tr>
</tbody>
</table>

1 Based on the Queensland Health Blueprint
2 Based on the Queensland Health Strategic Plan
The alignment of ICT capability requirements to health service capabilities, strategic objectives and whole-of-system principles is critical to ensure that ICT is a clear enabler for HHSSs (and Queensland Health) achieving target outcomes. It also provides a foundation from which the governance and operating model can be designed, with the purpose of enabling ICT to better serve HHSSs and Queensland Health in a more devolved system.

1.2 Define new decision making criteria to govern ICT investments in a more devolved model – creating flexibility to support alternate solution options including an as-a-service approach, and a more targeted role for central support.

Decision making for ICT needs to support enablement of HHSSs in achieving outcomes. This decision making must be agnostic of the underlying systems / technologies that might end up supporting HHS capabilities, so that clear direction can be defined for:

- How well different solution options meet ICT capability needs based on objective criteria. This will be achieved by defining a selection criteria under each ICT capability (see Exhibits 8, 9, 10, and 12 for an illustrative example)

- Whether the ICT capability requirements being addressed will impact centrally-relevant criteria (e.g., will central ICT need to be involved to ensure whole-of-system objectives are being met)? This is defined through a subset of the ICT capability criteria that are of particular relevance to whole-of-system objectives (see blue criteria items in Exhibits 10, 11 and 12).

1.3 Shift overall ICT approach to that of “enabling” HHSSs to deliver health services and outcomes, and reflect this across the ICT value chain and related decision making.

EXHIBIT 8

### ICT requirements to support health service capabilities

<table>
<thead>
<tr>
<th>ICT requirements</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interfaces</strong></td>
<td></td>
</tr>
<tr>
<td>1. Digital touch points</td>
<td>Web / Mobile enabled applications and engagement platforms to provide consumers and clinicians multiple access points to health information</td>
</tr>
<tr>
<td>2. Mobile care delivery platforms</td>
<td>Technologies and tools to support mobile / remote care delivery and access to care services (e.g., telehealth, telemonitoring, etc.), including upload of patient data for screening, monitoring and treatment purposes</td>
</tr>
<tr>
<td>3. Integrated ecosystem</td>
<td>Different interfacing technologies and integrated platform to facilitate seamless and consistent exchange of information</td>
</tr>
<tr>
<td><strong>Operational</strong></td>
<td></td>
</tr>
<tr>
<td>4. 360 degree view of consumers</td>
<td>Full view of consumer data by enabling information exchange across care modalities and settings to manage patient transition</td>
</tr>
<tr>
<td>5. Agile workforce management</td>
<td>Workforce management tools to support a more mobile and agile healthcare workforce (e.g., workforce management, optimisation and skills matching tools)</td>
</tr>
<tr>
<td>6. Timely and trusted clinical insights</td>
<td>Actionable insights at the right place (e.g., point of care) and time to enable clinical and management decision making – supporting decision making by clinicians and consumers</td>
</tr>
<tr>
<td>7. Timely and trusted operational insights</td>
<td>Technology and operational information enabled care delivery information (e.g., managing ED/OR wait time, inventory management)</td>
</tr>
<tr>
<td>8. Business process efficiency</td>
<td>Enable business process efficiency through process automation / augmentation (reducing cost and increasing utilisation)</td>
</tr>
<tr>
<td><strong>Business integrations</strong></td>
<td></td>
</tr>
<tr>
<td>9. Performance transparency</td>
<td>Standardised, transparent and benchmarked performance measurements (across cost, quality and access metrics)</td>
</tr>
<tr>
<td>10. Business intelligence</td>
<td>Longitudinal analysis of performance, outcomes, needs and related trends to enable population health management, (e.g., consistent risk stratification)</td>
</tr>
<tr>
<td>12. Integrated workspaces</td>
<td>Efficient and effective workspace (e.g., desktop, network connectivity, mobile devices) with seamless integration to support day-to-day business operations</td>
</tr>
<tr>
<td><strong>Core</strong></td>
<td></td>
</tr>
<tr>
<td>12. Consistent and exchangeable data structures</td>
<td>Common data structures to facilitate information exchange and full operational health record requirement, including consistent use of standards for data content and exchange</td>
</tr>
<tr>
<td>13. Secure communication</td>
<td>Secure clinical data exchange among physicians, practices, hospitals and other healthcare providers (support real-time information exchange / collaboration, and general knowledge sharing)</td>
</tr>
<tr>
<td>14. Reliable systems</td>
<td>Reliability and availability of the core systems (e.g., communication network, patient interfaces) to support health service delivery and operations across the network</td>
</tr>
<tr>
<td>15. Usable, flexible and scalable systems</td>
<td>Flexibility, scalability, ease and speed of adoption of ICT solutions / services</td>
</tr>
</tbody>
</table>
### EXHIBIT 9

**ICT requirements mapped to the health service capabilities**

<table>
<thead>
<tr>
<th>ICT requirements</th>
<th>Health service capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strategic</td>
</tr>
<tr>
<td>1. Digital touch points</td>
<td>✔</td>
</tr>
<tr>
<td>2. Mobile care delivery platforms</td>
<td>✔</td>
</tr>
<tr>
<td>3. Integrated ecosystem</td>
<td>✔</td>
</tr>
<tr>
<td>4. 360 degree view of consumers</td>
<td>✔</td>
</tr>
<tr>
<td>5. Agile workforce management</td>
<td>✔</td>
</tr>
<tr>
<td>6. Timely and trusted clinical insights</td>
<td>✔</td>
</tr>
<tr>
<td>7. Timely and trusted operational insights</td>
<td>✔</td>
</tr>
<tr>
<td>8. Business process efficiency</td>
<td>✔</td>
</tr>
<tr>
<td>9. Performance transparency</td>
<td>✔</td>
</tr>
<tr>
<td>10. Business intelligence</td>
<td>✔</td>
</tr>
<tr>
<td>11. Integrated workspaces</td>
<td>✔</td>
</tr>
<tr>
<td>12. Consistent and exchangeable data structures</td>
<td>✔</td>
</tr>
<tr>
<td>13. Secure communication</td>
<td>✔</td>
</tr>
<tr>
<td>14. Reliable systems</td>
<td>✔</td>
</tr>
<tr>
<td>15. Usable, flexible and scalable systems</td>
<td>✔</td>
</tr>
</tbody>
</table>

**ICT requirements criteria (1 of 3)**

<table>
<thead>
<tr>
<th>ICT requirements</th>
<th>Evaluation criteria</th>
</tr>
</thead>
</table>
| 1. Digital touch points | - Single landing point for consumers  
- Consistent EHR interface across all digital touch points  
- Consistent display and access of clinical information across different touch points  
- Consistent and reusable wellness and self-care advice  
- Transparency of local health services/providers  
- Advice on selecting the most appropriate service/provider type to meet consumer needs  
- Flexibility to be tailored to regional needs (e.g., include/emphasise indigenous health) |
| 2. Mobile care delivery platforms               | - Transmission of patient data (audio, visual, etc.) from one provider to other for analysis or diagnosis  
- Real-time interaction between healthcare facilities enabled by live data transmission and monitoring  
- Enabled remote provider/patient/provider/provider interaction via real-time videoconferencing, web and mobile technology  
- In-home personal monitoring tools |
| 3. Integrated ecosystem                          | - Real time integration between different interfacing technologies used across the network |
| 4. 360 degree view of consumers                  | - Consistent interface to capture customer data across all channels  
- Structured, high quality and consistent data  
- Availability of mechanisms by which trusted information can be exchanged between different systems  
- Easy means to access updated medical information for consumers and care providers |
| 5. Agile workforce management                    | - Segmentation of demand based on patient acuity levels and analysis of historical data to predict demand patterns  
- Capability and skills categorisation of the workforce  
- Workforce work and route planning tools  
- Workforce operational optimisation based on skill level and route plan  
- Consumer interfaces to support transparency of direct care workforce (e.g., see that physical therapist is due to visit you at home in 2 days) |
## ICT requirements criteria (2 of 3)

### Operational

<table>
<thead>
<tr>
<th>ICT requirements</th>
<th>Evaluation criteria</th>
</tr>
</thead>
</table>
| 6. Timely and trusted clinical insights | - Integration of data across care settings enriched with additional analytical insights (e.g., care episodes)  
- Quality and completeness of the physician documentation  
- Availability of tools for management reporting and analysis  
- Care providers enabled to make evidence-based decisions in diagnosis and treatment at the point of care, including:  
  - Alerts to remind care providers of opportunities to improve care quality and reduce errors  
  - Enable and/or guide the user to look up relevant reference information  
- Intelligently select, organise, and display relevant data  |
| 7. Timely and trusted operational insights | - Measurement of the patient throughput and satisfaction  
- Improved information availability for operational parameters (e.g., length of stay, ED wait times)  
- Inventory management  
- Measurement and reporting of utilisation for different facilities like OR, ICU, ED etc.  
- Measurement and reporting of staff utilisation and productivity  |
| 8. Business process efficiency | - Tools and processes to identify sources of variability in cost and utilisation  
- Consistent KPIs across the network  
- Measurement of consumer satisfaction and staff productivity  
- Improved information availability for operational parameters (e.g., length of stay, ED wait times)  
- Technology enabled health service and business processes  
- Root cause analysis and isolation of the problem areas  |

### Business enablement

<table>
<thead>
<tr>
<th>ICT requirements</th>
<th>Evaluation criteria</th>
</tr>
</thead>
</table>
| 9. Performance transparency | - Consistent KPIs across the network  
- Measurement of consumer satisfaction and staff productivity  
- Visual dashboards comparable across HHSs  
- Benchmarking of key lagging and leading indicators in real time  
- Track KPIs and publish performance reports  |
| 10. Business intelligence | - Centralised database of information to store aggregated data from multiple sources  
- Standardised methodology for risk stratification across the system  
- Normalisation of data and analysis to risk stratify sub-population for intervention  
- Health data more effectively available to improve public health surveillance and response  
- Availability of analytical platform  
- Minimum mandatory standards for health information insights across the health system  
- Data mining and pattern matching to prevent future medical episodes  
- Insights linked to actionable business outcomes  |
| 11. Integrated workspaces | - Logistics support (desktops, mobile devices, etc.) to the business for day to day operations  
- Seamless integration between different devices used  
- Ease of sharing of information between different stakeholders through shared drives, telephony or video conferencing facility  
- IT helpdesk to provide timely resolution to user issues  
- Timely upgrade of software and hardware used by users to enable productivity  |
| 12. Usable, flexible and scalable systems | - Definitions of health terminology to ensure data consistency  
- Definition of data structures to be used across the system (focused on EHR)  
- Standards for interoperability of different data types e.g., patient information, physician information  
- Real time, asynchronous and secure communication between different systems inside and outside the health network  
- Support collaboration and knowledge sharing  
- Reliability and availability of core systems (e.g., communication network, user interfaces) to ensure real time and trusted data communication  
- Scalable systems to ensure sustainability of investments  
- System interfaces and processes designed / developed in a way that they are adopted easily and quickly by the end users  
- Systems flexible enough to cater to local needs  |

### Core

<table>
<thead>
<tr>
<th>ICT requirements</th>
<th>Evaluation criteria</th>
</tr>
</thead>
</table>
| 11. Reliable systems | - Definitions of health terminology to ensure data consistency  
- Definition of data structures to be used across the system (focused on EHR)  
- Standards for interoperability of different data types e.g., patient information, physician information  
- Real time, asynchronous and secure communication between different systems inside and outside the health network  
- Support collaboration and knowledge sharing  
- Reliability and availability of core systems (e.g., communication network, user interfaces) to ensure real time and trusted data communication  |

### Attributes

- **Operational**
- **Business enablement**
- **Core**

**Note:** Preliminary – For Discussion
2. LARGE PROJECTS

2.1 Adopt a co-design process across ICT strategic priorities, solution options and vendor selection, working in partnership with HHSs and with input from expert advisors / partners.

2.2 Ensure all ICT projects are part of bigger HHS business projects and link to HHS strategic plans.

Linking ICT strategic projects to HHS strategic plans should be done in alignment with the ICT strategic framework (see Exhibit 7) – first identifying what changes in health service capabilities are required to achieve HHS strategic priorities, and then defining the ICT capabilities / changes that are needed to enable these health service capabilities.

2.3 Ensure all projects have a business owner(s) accountable for the whole project—business case through to benefits realisation.

2.4 Shift the role of the centre to that of enabling HHSs to deliver large projects leveraging central capabilities, whilst ensuring minimum architecture, security and integration standards are being met.

The current central ICT organisation takes accountability for leading all ICT projects related to ‘enterprise’ ICT systems / services. As the focus shifts to only having ‘business’ projects enabled by ICT (and not stand-alone ICT project), HHSs will more actively lead ICT enabled initiatives. In addition, the transition to an as-a-service approach to ICT will lead to greater leverage of ICT vendor capabilities in delivering ICT solutions / services. In this context, the central ICT group will need to have greater emphasis on demand management, architecture, strategic procurement, vendor management and overall program management capabilities. These capabilities will be deployed in working with HHSs to help them deliver on ICT projects / programs, and related benefits.

2.5 Hold project funds centrally for the time being, and allocate through the ICT Strategy Board for large projects (note: large capital projects will still go through the current escalation / review process and the CBRC).

Please see Exhibit 13 for an overview of the near-term fund holding recommendations, covering large projects as well as ICT operations.
3. OPERATIONS

3.1 Transition ICT operating accountabilities to HHSs, together with the required capability development and support funding – following a collaborative and structured process to set priorities, identify contestability options and support the transition (e.g., similar to the current IR process being run with HHSs).

The process to transition ICT accountabilities to HHSs needs to be structured in order to support (a) rigorous planning and preparation, (b) development of enabling HHS capabilities, (c) early piloting to de-risk broader change, and (d) contestability for selected capabilities / services (see Exhibit 14). Furthermore, the central ICT group will continue to support the ICT operations for solutions, platforms and services that are system-wide (e.g., core system infrastructure, knowledge services).
3.2 Build HHS ownership and accountability for ICT operations through a stronger outcomes orientation.

3.3 Ensure central accountability for core ICT infrastructure – such as information exchange backbone, security and data services (to be centrally facilitated and optimised, and delivered as a service to enable HHSs).

4. GOVERNANCE AND OPERATING MODEL

The ICT governance and operating model needs to support a more devolved model, where HHSs have greater accountability for ICT, as well as the related outcomes that ICT spend enables. This devolution of accountabilities needs to trade-off central versus devolved versus collaborative decision making (see Exhibit 15), and get applied across the whole ICT value chain (see Exhibit 16).
There are three archetypes that represent a broad range of options for ICT accountabilities

<table>
<thead>
<tr>
<th>Key points</th>
<th>Centre-dominant</th>
<th>Collaborative</th>
<th>Region-dominant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal differentiation between HHS ICT capabilities</td>
<td>Partnership approach between the central ICT and HHSs</td>
<td>• Individualised approach in each HHS</td>
<td></td>
</tr>
<tr>
<td>Focused on efficiency and economies of scale</td>
<td>Focused on enabling the HHS outcomes</td>
<td>• Focused on local outcomes and tailored care services</td>
<td></td>
</tr>
<tr>
<td>HHSs have similar needs and provider types</td>
<td>Decisions require significant input (and trade-offs) from HHS and centre</td>
<td>• HHSs differ significantly in their needs across consumer and provider types</td>
<td></td>
</tr>
<tr>
<td>Central ICT team accountable for benefits realisation</td>
<td>HHS and centre have clear accountabilities and shared target outcomes</td>
<td>• HHSs are fully accountable for outcomes and benefits realisation</td>
<td></td>
</tr>
<tr>
<td>Stable care delivery model</td>
<td>Mutual benefit exists in sharing decisions / information between HHS and centre</td>
<td>• Care delivery models are changing and would benefit from bottom-up innovation</td>
<td></td>
</tr>
<tr>
<td>Centrally managed systems can be tailored to meet local needs</td>
<td></td>
<td>• Highly standardised and interoperable technology platforms / vendors</td>
<td></td>
</tr>
<tr>
<td>Significant economies of scale exist</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low standardisation and interoperability between technology platforms / vendors</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Potential risk
- Less bandwidth as decisions are focused in one central group
- Less focus on bottom-up innovation
- Less accountability at local level
- Coordination may increase lead times
- Less transparency may impede responsiveness / engagement
- Consensus based decision making leading to complexity in decision making and a governance burden
- Contention regarding governance committee representation (lots of potential variations)
- Difficulty to driving system level outcomes (not aligned with local priorities)
- Difficulty in managing the health system overall
- Difficult to share best-practice across HHSs
- Inefficiencies / costs creeping into independent HHS ICT platforms / vendor agreements

EXHIBIT 16
Key decisions / activities across the ICT value chain

<table>
<thead>
<tr>
<th>Strategy definition</th>
<th>Purpose</th>
<th>Key decisions / activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy and policy</td>
<td>Ensure ICT enables business strategy and outcomes, and directly supports business operating plans</td>
<td>• Health system objectives and target outcomes</td>
</tr>
<tr>
<td>Architecture and standards</td>
<td>Overarching architecture and standards to enable a distributed environment to work in a coordinated / linked way</td>
<td>• Health system ICT strategy</td>
</tr>
<tr>
<td>Demand management</td>
<td>• Business demand and change priorities</td>
<td></td>
</tr>
<tr>
<td>Program delivery</td>
<td>• Initiative / capital portfolio definition (Business and ICT)</td>
<td></td>
</tr>
<tr>
<td>Operations</td>
<td>• Change management and adoption</td>
<td></td>
</tr>
<tr>
<td>Information and knowledge services</td>
<td>• Benefits realisation and tracking</td>
<td></td>
</tr>
</tbody>
</table>

| Strategy and policy | • Program / initiative stage gating and funds release |
| Business demand and change priorities | • Program management |
| Initiative / capital portfolio definition (Business and ICT) | • Project / initiative delivery |
| Change management and adoption | • Vendor / supplier delivery management |
| Benefits realisation and tracking | • Procurement and contract management |

| Strategy and policy | • Manage program / initiative delivery including staged release of funds |
| Program management | • IT operations (incl. maintenance and end user support) |
| Vendor / supplier delivery management | • Core IT infrastructure (e.g., data centre) |
| Procurement and contract management | • Validation/testing services for applications and devices |

| Strategy and policy | • Provide a trusted source of data and integration services |
| Business demand and change priorities | • Data quality assurance |
| Initiative / capital portfolio definition (Business and ICT) | • Information access management |
| Change management and adoption | • Value added information and knowledge services |

 informant: ICT governance case studies
We propose transitioning decision-making authority from a more centre-dominant approach (as it is today) to a more collaborative and even regionally-dominant model (see Exhibit 17). This new model of decision making needs to support an ongoing role by Queensland Health (and in-turn the central ICT group) to support coordination and minimum standards across Queensland Health that directly enable whole-of-system objectives.

To support the devolution of ICT accountabilities and decision-making authority, together with the changing role and capabilities of central ICT, a number of supporting changes are recommended to key central roles and governance (see Exhibit 18).

| EXHIBIT 17 |

### Decision making authorities

<table>
<thead>
<tr>
<th>Key activities and accountabilities</th>
<th>Authority for each stakeholder</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health system strategic priorities and target outcomes</td>
<td>D</td>
<td>C</td>
</tr>
<tr>
<td>Health system ICT strategy</td>
<td>D</td>
<td>C</td>
</tr>
<tr>
<td>Business / HHS strategic operating plan</td>
<td>D</td>
<td>C</td>
</tr>
<tr>
<td>Business / HHS ICT strategy</td>
<td>D</td>
<td>C</td>
</tr>
<tr>
<td>Regional / vendor strategy</td>
<td>D</td>
<td>C</td>
</tr>
</tbody>
</table>

### PRELIMINARY – FOR DISCUSSION

<table>
<thead>
<tr>
<th>Authority for each stakeholder</th>
<th>D</th>
<th>C</th>
<th>I</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joint committee / HHS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business</td>
<td>D</td>
<td>C</td>
<td>I</td>
<td>C</td>
</tr>
<tr>
<td>Central ICT</td>
<td>D</td>
<td>C</td>
<td>I</td>
<td>C</td>
</tr>
<tr>
<td>DSITIA</td>
<td>D</td>
<td>C</td>
<td>I</td>
<td>C</td>
</tr>
</tbody>
</table>

### Strategy and policy

- Enterprise architecture and roadmap, information architecture, domain architecture
- Business / HHS architecture
- Technical architecture and standards
- Business / HHS ICT strategy

### Architecture and standards

- Enterprise architecture and roadmap
- Information architecture, domain architecture
- Technical architecture and standards
- Business / HHS architecture

### Demand management

- Business demand and change priorities
- Initiative / capital portfolio definition (Business and ICT)
- Change management and adoption
- Benefits realisation and tracking

### Initiative planning and delivery

- Program / initiative stage gating and funds release
- Program management
- Project / initiative delivery
- Vendor / supplier delivery management
- Procurement and contract management

### Program delivery

- Program / initiative stage gating and funds release
- Program management
- Project / initiative delivery
- Vendor / supplier delivery management
- Procurement and contract management

### Operations/BAU

- IT operations (incl. maintenance and end user support)
- Case IT infrastructure (e.g., data centers)
- Validation testing services for apps/devices
- Information and knowledge services
- Data quality assurance
- Information access management
- Value added information and knowledge services

### PRELIMINARY – FOR DISCUSSION

1. Business / HHS represent the Queensland Health (QH) business units and the HHSs.
2. Central ICT team will decide on the enterprise wide projects and will provide consultation to local projects.
These changes require reconfiguring the central ICT group to better support a split focus between (a) strategy and portfolios, and (b) operations (see Exhibit 19). The interim role of the Transition Executive Director will most likely precede the appointment of a Chief Health Information Officer (CHIO), and in addition to leading the transition of ICT accountabilities to HHSs, will need to assume responsibility for architecture, standards, business partner development and program delivery.
As a result of the proposed changes to the central ICT governance, there will need to be three governance committees to oversee the ICT value chain (see Exhibit 20):

- **ICT Strategy Board (ISB)** – governing overall ICT strategy, strategic procurement and large projects
- **ICT Program Board** – governing ICT operations, information management, knowledge services, smaller projects (not governed by the ISB), and the transition of overall ICT accountabilities to HHSs
- **Architecture Standards Board (ASB)** – governing overall architecture and standards, data model governance, and ensuring compliance across sizeable projects that impact centrally-relevant ICT capability criteria.

### High level structure for central ICT

<table>
<thead>
<tr>
<th>Strategy and portfolios (CHIO)</th>
<th>Operations (CTO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy and Policy</td>
<td>Program and system delivery</td>
</tr>
<tr>
<td>Architecture Group</td>
<td>Programs</td>
</tr>
<tr>
<td>Information and Knowledge</td>
<td>Resource and Program Excellence</td>
</tr>
<tr>
<td>Clinical Care</td>
<td>Resource</td>
</tr>
<tr>
<td>Portfolio Management</td>
<td>Procurement</td>
</tr>
<tr>
<td>Integrated Care</td>
<td>Portfolio delivery</td>
</tr>
<tr>
<td>Portfolio definition (demand)</td>
<td>Portfolio delivery</td>
</tr>
<tr>
<td>Strategic and Policy</td>
<td>Portfolio delivery</td>
</tr>
<tr>
<td>Governance</td>
<td>Portfolio delivery</td>
</tr>
<tr>
<td>Innovation</td>
<td>Portfolio delivery</td>
</tr>
<tr>
<td>Knowledge Services</td>
<td>Portfolio delivery</td>
</tr>
<tr>
<td>Analytics Service</td>
<td>Portfolio delivery</td>
</tr>
<tr>
<td>Collection Programs</td>
<td>Portfolio delivery</td>
</tr>
<tr>
<td>Financial Operations, Planning</td>
<td>Portfolio delivery</td>
</tr>
<tr>
<td>Policy and Commissioning</td>
<td>Portfolio delivery</td>
</tr>
<tr>
<td>Clinical and Social Care</td>
<td>Portfolio delivery</td>
</tr>
<tr>
<td>External Stakeholders and</td>
<td>Portfolio delivery</td>
</tr>
<tr>
<td>Policy and</td>
<td>Portfolio delivery</td>
</tr>
<tr>
<td>Determination</td>
<td>Portfolio delivery</td>
</tr>
<tr>
<td>Strategic</td>
<td>Portfolio delivery</td>
</tr>
<tr>
<td>Procurement</td>
<td>Portfolio delivery</td>
</tr>
<tr>
<td>Expert Group</td>
<td>Portfolio delivery</td>
</tr>
<tr>
<td>Health Relationship Managers</td>
<td>Portfolio delivery</td>
</tr>
</tbody>
</table>

Notes:
- The number and composition of customer facing demand subgroups could be varied depending on workload and similarities in requirements.
- Teams may be staffed with subject matter experts in the demand function, and should also draw on project managers and technical experts e.g., from Architecture & standards and Program & systems delivery, in order to embed a continuous team in the end-to-end project lifecycle.
- Strategy and policy functions are expected to be in thin client assisting demand management with policy engagement.
- Source: McKinsey Healthcare Practice

---

**EXHIBIT 19**

**PRELIMINARY – FOR DISCUSSION**

ICT leadership team
Demand subgroups
Transition Executive
Director interim responsibility
For sizeable projects (> $500k or assessed as having a high risk profile) that impact a centrally-relevant ICT capability criteria, the centre can assume four high-level modes in supporting the related ICT solution (see Exhibit 21):

- Creating a common / shared ICT system capability across HHSs (or a subset of HHSs)
- Defining and enabling run-time integration of ICT systems / services
- Defining standards for diverse ICT system capabilities
- Providing procurement support – enabling better decision making or improved value capture.

The exact role that the centre takes will be determined in partnership with HHSs through one of the proposed governance committees.
4.1 Establish a new governance committee – the ICT Strategy Board (ISB) – to oversee strategy definition, architecture / standards, portfolio management (including demand management), benefits realisation and large projects (represented by HHSs, leading clinicians and independent advisors).

4.2 Refocus the ICT Portfolio Board to govern operations, project delivery and core infrastructure, increase HHS representation to >50% and rename the committee to the ICT Program Board.

4.3 Appoint new Chief Health Information Officer (CHIO) to lead the strategic ICT central group – covering strategy, architecture / standards, information and knowledge management, clinical informatics, portfolio management and benefits realisation.

4.4 Re-focus HSIA on core / central ICT operations and project delivery, and change the current CIO role to Chief Technology Officer (CTO) – with the CHIO organisation taking on more strategic accountabilities and HHSs picking up greater ICT operations accountabilities.

4.5 Appoint an interim Transition Executive Director to oversee the transition of ICT accountabilities to HHSs, providing support for interim governance and HHS capability development.

The Transition Executive Director will be taking on a set of responsibilities in order to support large projects and lead the transition of ICT accountabilities to HHSs:

- Architecture and standards – establishing the foundation for ICT investment and varied solution/service options in a more developed ecosystem
Program Delivery – including stage gating of programs (and stopping of programs / projects where required), overall contract and commercial management

Business and partner development – in support of transitioning ICT operating accountabilities to HHSs and managing contestability as part of that process

Oversight of ICT operating budgets and funding – as required to support effective transition to HHSs and related contestability priorities.

4.6 Develop central capability to support HHSs – strategy and architecture, portfolio management (including business case development, demand management and resource management), strategic partnerships and procurement, vendor management, program management, information and integration management.

Strategic partnerships will be a key enabler for ICT across the whole value chain (see Exhibit 22). The role of strategic partnerships will also be critical in the co-design process – including HHSs, vendors, industry partners, health services providers, etc. These strategic partnerships will need to support Queensland Health and HHSs with much valued (and needed) capabilities, and at the same time support contestability and fairness in the procurement process.

EXHIBIT 22

<table>
<thead>
<tr>
<th>Guiding principles</th>
<th>Area</th>
<th>Objective</th>
<th>Potential partner targets</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Facilitate contestability and value based service delivery</td>
<td>Strategy and architecture</td>
<td>Understanding best practices for defining ICT strategy in order to meet business outcomes and support a transformation</td>
<td>Global public and private health networks who have undergone ICT-enabled transformations</td>
<td>Kaiser Permanente, NZ Health, NHS</td>
</tr>
<tr>
<td>- Create room for (a) multiple vendors to propose for work, and (b) flexibility for vendors to innovate in order to better serve business needs and deliver value</td>
<td></td>
<td>Bring in required architecture capabilities in order to support a more devolved and networked system</td>
<td>ICT providers with experience in architecture / standards across diverse ICT platforms / systems</td>
<td>dbMotion, Health Catalyst</td>
</tr>
<tr>
<td>- Enable strategic (outcome based) partnerships to be established with vendors where appropriate – supporting decision making and innovation at multiple levels</td>
<td>Initiative planning and delivery</td>
<td>Stand up best-practice PMO across centre and HHSs</td>
<td>PMO and change management specialists</td>
<td>ICT service providers and system integrators</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Facilitate change management toward an improved delivery capability and more rigorous delivery management / governance</td>
<td>ICT consultancies (e.g., Accenture, IBM)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Operations</td>
<td>Outsourcing of commodity services or services where internal capability does not exist</td>
<td>ICT service providers and system integrators</td>
<td>ICT consultancies (e.g., IBM, Infosys)</td>
</tr>
</tbody>
</table>

To support more effective partnerships, Queensland Health can develop a more strategic approach to procurement by applying five key levers (see Exhibit 23):
- **Sourcing strategy** – defining and classifying sourcing activities, and identifying the sourcing potential for each area and the target vendor set

- **Supplier selection** – selecting third party vendors in a fact-based and objective manner, based on a developed understanding of the market and vendor due-diligence

- **Best practice contracting** – managing contracts to deliver maximum sourcing benefits while complying with tendering rules and creating visibility into contract terms / spend

- **Vendor management organisation** – managing ongoing relationships with vendors within an overall structure, roles and decision making rights – balancing central vs. devolved authority

- **Managing vendor delivery** – day-to-day management (focusing on identifying gaps and improvement levers) to prevent poor delivery and cost overruns.

**EXHIBIT 23**

To underpin this approach, HHSs as well as the central ICT group will need to build best-practice procurement capabilities across three dimensions (see Exhibit 24):

- **Technical and functional capabilities**

- **Managerial capabilities**

- **Skills building, mindsets and behaviours**
Priorities for capability development, as well as the relative emphasis between HHSs and Queensland Health, should be jointly determined (recognising that smaller HHSs may not have the critical size to warrant the development of more advanced capabilities).

EXHIBIT 24

**Procurement capabilities differ according to organisational maturity level**

<table>
<thead>
<tr>
<th>Technical/functional</th>
<th>Basic – Establish foundation</th>
<th>Medium – Create a solid team</th>
<th>Advanced – Reach for the next S-curve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skills, mindsets, and behaviors</td>
<td>• Basic quantitative skills e.g., Excel/Access</td>
<td>• Procurement toolbox e.g., Linear performance pricing</td>
<td>• Procurement tools e.g., Clean sheet modeling</td>
</tr>
<tr>
<td></td>
<td>• Accounting and Finance e.g., P&amp;L, NPV, DCF</td>
<td>• Working capital / Inventory management</td>
<td>• Advanced negotiation skills</td>
</tr>
<tr>
<td></td>
<td>• Spend mapping</td>
<td>• Supply and demand economics</td>
<td>• Advanced problem solving</td>
</tr>
<tr>
<td></td>
<td>• TCO Analysis</td>
<td>• RFx-process / analyses</td>
<td>• Logic trees</td>
</tr>
<tr>
<td></td>
<td>• Supply market analyses</td>
<td>• Supplier economics and cost curves</td>
<td>• Pyramid principle</td>
</tr>
<tr>
<td></td>
<td>• Standardisation of specifications</td>
<td>• Lean diagnostics (at suppliers)</td>
<td>• Supplier economics and cost curves</td>
</tr>
<tr>
<td></td>
<td>• Contract structure + closing</td>
<td>• Make vs. buy decisions</td>
<td>• Supplier development</td>
</tr>
<tr>
<td></td>
<td>• Prioritisation</td>
<td>• Global sourcing</td>
<td>• Innovation sourcing</td>
</tr>
<tr>
<td></td>
<td>• Work planning and structuring</td>
<td>• Risk management toolkit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Performance management program</td>
<td>• Managing cross functional teams</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Communicating objectives / providing direction</td>
<td>• Career planning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Establishing clear targets</td>
<td>• Managing people and teams</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Articulating individual targets</td>
<td>• Contract structure and closing</td>
<td>• Contract structure and closing</td>
</tr>
<tr>
<td></td>
<td>• Role modeling</td>
<td>• Creating incentive systems / performance metrics and dialogues</td>
<td>• Creating incentive systems / performance metrics and dialogues</td>
</tr>
<tr>
<td></td>
<td>• Coaching others</td>
<td>• Dealing with different personalities (MBTI)</td>
<td>• Dealing with different personalities (MBTI)</td>
</tr>
<tr>
<td></td>
<td>• Dealing with different personalities (MBTI)</td>
<td>• Conducting developmental discussions</td>
<td>• Conducting developmental discussions</td>
</tr>
<tr>
<td></td>
<td>• Influencing / inspiring others</td>
<td>• Influencing / inspiring others</td>
<td>• Influencing / inspiring others</td>
</tr>
</tbody>
</table>

1 Myers Briggs Type Indicator

**4.7 Create focus and structured support for innovation** across all phases of the ICT value chain, and implement incentives for innovation creation and dissemination.

Innovation will be a critical capability and culture to enable Queensland Health to adapt to increasing disease burden, changing care models, increasing consumer demand and higher pressure on productivity. Multiple sources of bottom-up innovation need to be supported across the ICT value chain, with innovation taking on a prominent role in ICT governance (see Exhibit 25).

Given the important role of innovation, and the expected increase in investment to support innovation, a greater rigour to managing the innovation pipeline is recommended (see Exhibit 26). The specific design of innovation governance should be determined based on HHS priorities and a more detailed review of the current / expected innovation pipeline.
Supporting innovation across the health system

**Relevance of innovation**
- HHSs are facing pressure to improve productivity
- Consumers are more demanding and seeking greater transparency and influence over healthcare
- Clinicians are engaging more in technology and innovating in how it can support care delivery
- Care delivery models are evolving e.g., coordinated care, chronic disease management
- Queensland Health needs to create a platform and incentives to supporting bottom-up innovation (and the diffusion of proven innovations)

**How do we enable innovation?**

**Set innovation priorities / themes**
- Focus on innovation and set priorities as part of strategic planning – including business, clinical and ICT innovation priorities
- Identify key mindset / behaviour shifts required to support innovation, and design initiatives to drive that shift
- Monitor domestic and global healthcare landscape for relevant innovations / business models / etc.

**Ringfence innovation resources**
- Create innovation fund to subsidise development of innovative ideas (e.g., NHS Tech Fund provides 50% subsidy to selected ideas)
- Encourage HHSs to spend a part of surplus and support innovation ‘champions’ to develop and implement innovations

**Establish innovation incentives**
- Develop incentives to support the adoption and diffusion of innovation (e.g., innovation benchmarking across HHSs, adoption awards)
- Provide teams with opportunity to present successful innovations across the network

**Integrate innovation into business and ICT governance**
- Commit to meaningful KPIs regarding innovation e.g., number of innovative ideas adopted from other HHSs
- Govern innovation more rigorously – track innovation pipeline and actively managed transition of innovative ideas
- Support broad stakeholder engagement for innovation (e.g., internal, vendors, etc.) and create enabling committees

---

**EXHIBIT 26**

**A staged process could be implemented to foster systematic innovation**

**Stage 1: Search**
- **Stage 1A: Gather ideas**
  - Internally driven ideas
  - Market-driven ideas
  - Consumer-driven ideas
- **Stage 1B: Organise selected concepts around innovation platforms**
  - Open collaboration

**Stage 2: Design**
- **Stage 2A: Develop detailed value propositions**
  - High level P&L calculation
- **Stage 2B: Validate propositions**
  - Launch small scale tests / prototypes
  - State and retest concepts

**Stage 3: Prototype**
- **Stage 3A: Launch small scale tests / prototypes**
- **Stage 3B: Validate concepts**
  - Market feasibility
  - Technical feasibility
  - Value creation
  - Economic potential
  - Regulatory impacts
  - Risk mitigation opportunities

**Stage 4: Launch**
- Roll-out successful new products

**Useful KPIs for preliminary idea selection**
- Sourcing
  - Breadth of sources
  - Source efficiency
- Strategic alignment
- Change of customer experience
- Competitive advantage
- New revenue opportunity offer

**Useful KPIs for concept evaluation / filtering**
- Potential to scale
- Level of innovation / competitive differentiation
- Strategic fit
- Financial opportunity
- Time to market

**Useful KPIs for concept validation**
- Market feasibility
- Technical feasibility
- Value creation
- Economic potential
- Regulatory impacts
- Risk mitigation opportunities

**Useful KPIs for prototype approval**
- Market response
- Economic potential refined
- Ability to launch
- Level of uncertainty

**Timing**
- Ongoing
- Quarterly
- Semi-annually
- As needed

**Source:** McKinsey Innovation Practice
Roadmap and immediate priorities

5. OVERALL ICT STRATEGIC ROADMAP

In order to set an aligned direction and priorities for Queensland Health ICT over the coming years, there needs to be a longer-term ICT strategic roadmap developed in partnership with HHSs. This roadmap will define the ICT capability priorities in direct support of health services priorities and objectives over the next 5 to 10 years.

There are three key inputs to inform the definition of the ICT strategic roadmap:

- Queensland Health strategic objectives and target outcomes – including a meaningful interpretation for each HHS
- Health service capability priorities and strategic changes required to support set outcomes
- An assessment of the maturity of the current ICT capabilities and related changes needed to support health services capabilities (see Exhibit 27 for a preliminary assessment).

EXHIBIT 27

<table>
<thead>
<tr>
<th>High-level ICT system capabilities assessment</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ICT system capabilities</td>
<td>Description</td>
<td>Related ICT requirements</td>
</tr>
<tr>
<td>Electronic Health Record (EHR)</td>
<td>Effective creation and sharing of a unified electronic medical record for each patient</td>
<td>Digital touch points, Mobile care delivery platforms, 360 degree view of consumers, Integrated ecosystem</td>
</tr>
<tr>
<td>Care Process Automation</td>
<td>Tools clinicians use to make care decisions and ensure that others agree and act on those decisions</td>
<td>Timely and trusted clinical insights, Business process efficiency, Process transparency</td>
</tr>
<tr>
<td>Patient Administration System</td>
<td>All the non-clinical aspects to patient care (e.g., scheduling, billing)</td>
<td>Agile workforce management, Operational insights, Business process efficiency, Process transparency</td>
</tr>
<tr>
<td>Ancillary integration</td>
<td>Integrate ancillary caregivers into all of the above (e.g., lab, pharmacy, nursing homes)</td>
<td>Agile workforce management, Operational insights, Integrated ecosystem, Performance/transparency</td>
</tr>
<tr>
<td>Health Intelligence</td>
<td>Gather and process populations-level insights from the health system to make enterprise business decisions</td>
<td>Business intelligence</td>
</tr>
<tr>
<td>Telehealth</td>
<td>Use of technology to facilitate care when people are not standing in the same room</td>
<td>Mobile care delivery platforms</td>
</tr>
<tr>
<td>Patient Engagement</td>
<td>Effective creation and sharing of a unified electronic medical record for each patient</td>
<td>Mobile touch points, Mobile care delivery platforms, 360 degree view of consumers, Timely and trusted clinical insights</td>
</tr>
<tr>
<td>Core capabilities</td>
<td>Application and information architecture, data structures, secure communication, reliable systems</td>
<td>Consistent data structure, Secure communication, Reliable systems, Usable, flexible and scalable systems</td>
</tr>
<tr>
<td>Corporate / admin systems</td>
<td>Support finance, HR, supporting operations of the whole organisations</td>
<td>Agile workforce management, Operational insights, Performance/transparency</td>
</tr>
</tbody>
</table>
- **Build foundations (1-2 years)** – strong foundation to enable best-practice healthcare in a devolved ecosystem
- **Deliver coordinated, value-based care (2-5 years)** – patient-centred and value-based care delivery pathways
- **Integrated end-to-end health management (5-10 years)** – population health management, wellness and prevention

---

**Illustrative strategic roadmap – to be co-designed with HHSs**

<table>
<thead>
<tr>
<th>Build foundation (1-2 years)</th>
<th>Deliver coordinated, value-based care (2-5 years)</th>
<th>Integrated E2E health management (5-10 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vision</strong></td>
<td><strong>Health service priorities</strong></td>
<td><strong>ICT capability priorities</strong></td>
</tr>
<tr>
<td>To be defined in a co-design process with HHSs and the Queensland Health Department</td>
<td>Health service priorities may contain elements of a broader set of strategic, operational, administrative and cultural capabilities</td>
<td>Core capabilities to enable exchange of patient information (e.g., create a foundation through EHR and PAS)</td>
</tr>
<tr>
<td><strong>ICT capability priorities</strong></td>
<td><strong>Governance and operating model priorities</strong></td>
<td></td>
</tr>
<tr>
<td>Strong foundation to enable best-practice + healthcare in a devolved ecosystem</td>
<td>To be defined in a co-design process with HHSs and the Queensland Health Department</td>
<td>Core capabilities to enable exchange of patient information (e.g., create a foundation through EHR and PAS)</td>
</tr>
<tr>
<td>Patient-centred and value-based care delivery pathways</td>
<td>Devolved operational ICT accountability and operating budget to HHSs (as much as practical), with contestability options captured</td>
<td>Core capabilities to enable exchange of patient information (e.g., create a foundation through EHR and PAS)</td>
</tr>
<tr>
<td>Care providers actively coordinate care delivery across setting and in alignment with an end-to-end care pathway</td>
<td>Stronger HHS and central capabilities to support a more devolved ecosystem</td>
<td>Care providers actively coordinate care delivery across setting and in alignment with an end-to-end care pathway</td>
</tr>
<tr>
<td>Care providers actively coordinate care delivery across setting and in alignment with an end-to-end care pathway</td>
<td>A co-design approach as a new way of working across ICT governance and decision-making (working with HHSs, vendors and broader stakeholders)</td>
<td>Advanced contestability model – delivering best-practice services across ICT as well as health service delivery (actively engaged with the market)</td>
</tr>
<tr>
<td>Stronger outcomes orientation enabled by the commissioning approach</td>
<td>Stronger HHS and central capabilities to support a more devolved ecosystem</td>
<td>Best-practice strategic partnerships across the ICT value chain, and a mature strategic procurement approach</td>
</tr>
<tr>
<td>Devolved operational ICT accountability and operating budget to HHSs (as much as practical), with contestability options captured</td>
<td>Central accountability for core ICT infrastructure and capabilities in support of whole-of-system objectives</td>
<td>Strong innovation backbone across health service delivery and ICT solutions / services</td>
</tr>
<tr>
<td>Advanced contestability model – delivering best-practice services across ICT as well as health service delivery (actively engaged with the market)</td>
<td>Stronger HHS and central capabilities to support a more devolved ecosystem</td>
<td>Greater HHS accountability for ICT – including operations and large projects, with supporting capabilities and funding</td>
</tr>
<tr>
<td>Best-practice strategic partnerships across the ICT value chain, and a mature strategic procurement approach</td>
<td>Central accountability for core ICT infrastructure and capabilities in support of whole-of-system objectives</td>
<td>Stronger outcomes orientation enabled by the commissioning approach</td>
</tr>
</tbody>
</table>

---

### 6. SHORT-TERM ROADMAP

Making meaningful change quickly will be critical to rebuilding HHS ownership of Queensland Health ICT and addressing immediate issues. In this regard, we recommend a number of changes to be made in the first 60 to 90 days – including a combination of decisions, announcement and governance changes (see Exhibit 29).
**EXHIBIT 29**

**Preliminary Queensland Health ICT short-term roadmap**

<table>
<thead>
<tr>
<th>May-Jun</th>
<th>Jul-Sep</th>
<th>Oct-Dec</th>
<th>Jan-Mar</th>
<th>Apr-Jun</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Announce decision to devolve ICT ownership to HHSs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Announce new governance structure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Form interim ICT Strategy Board (ISB) with SAC members</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Initiate co-design process and set priorities with HHSs – including commitment to jointly create the ICT action plan</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Initiate an architecture definition project, with ISB oversight, to support devolved ecosystem</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Advertise new Chief Health Information Officer (CHIO) role</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Initiate ISB review of core ICT solutions based on agreed priorities (e.g., iEMR, PAS, FAMMIS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Announce operational ICT transition process and appoint an ICT Transition Executive Director</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Appoint new CHIO (at least interim)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Communicate revised approach and plan for priority 2-3 ICT solutions (co-designed with HHSs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Release new enterprise / information architecture</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Announce new strategic planning process – governed through ISB with oversight from CHIO</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Other (TBC) – architecture, iEMR, PAS, FAMMIS milestones</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Announce Queensland Health and HHS strategic priorities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Other (TBC) – architecture, iEMR, PAS, FAMMIS milestones</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Other (TBC) – architecture, iEMR, PAS, FAMMIS milestones</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

6.1 Establish a baseline for a more devolved health ecosystem

- Form the new ICT Strategy Board (to be potentially represented in the interim by the Strategic Advisory Committee)
- Change the charter and composition of the ICT Portfolio Board and rename it to the ICT Program Board – focus more on operations and information management, and increase HHS representation
- Initiate an architecture definition project, with ICT Strategy Board oversight, to define the enterprise architecture that will support a devolved ecosystem and greater solution / vendor flexibility (note: seek external support and expertise to complete this project)
- Announce new CHIO role and structure, and start recruitment process.

6.2 Initiate process to transition operational accountability and budgets for ICT to HHSs. Appoint a Transition Executive Director to lead the work with oversight and steering provided by the ICT Program Board.

6.3 Initiate a co-design process and set priorities with HHSs – including commitment to jointly create the ICT action plan – with oversight by the new ICT Strategy Board. As first order of business, initiate a review of core ICT solutions based on agreed priorities (e.g., iEMR, PAS, FAMMIS).
Appendix A – best-practice examples of ICT capabilities

EXHIBIT 30

Best-practice examples of how ICT capability requirements can be addressed (1 of 3)

<table>
<thead>
<tr>
<th>ICT requirements</th>
<th>Best practice example</th>
<th>Company</th>
</tr>
</thead>
</table>
| 1. Digital touch points | - Mobile apps to drive patient loyalty, manage wellness and control costs e.g., KPLocator, Mix it Up and Thrive Across America  
- The KP app can help you locate facilities, access medical records, refill prescriptions, make appointments, email care givers and view lab results  
- Devices chosen based on patient needs, complexity of disease and ability to use technology  
- The data is risk-stratified and colour coded alerts inform care coordinations interventions, ranging from patient self-help, phone call or emergency attention  
- Patients have 24/7 access to care services, enhanced through the use of nurse care coordinators, case managers and telehealth  
- Patients can access their EHR, view Internet-based lab results, get clinical reminders, self-scheduling, secure e-mail with providers, prescription refills, and educational content  
- Web portals facilitate data sharing between fragmented providers  
- EHR available to non-Geisinger referring physicians and patients through customised Web portals  
- Regular practice-level performance reports and meetings to monitor results and drive improvement  
- Mobile apps to drive patient loyalty, manage wellness and control costs e.g., KPLocator, Mix it Up and Thrive Across America  
- The KP app can help you locate facilities, access medical records, refill prescriptions, make appointments, email care givers and view lab results  
- Devices chosen based on patient needs, complexity of disease and ability to use technology  
- The data is risk-stratified and colour coded alerts inform care coordinations interventions, ranging from patient self-help, phone call or emergency attention  
- Patients have 24/7 access to care services, enhanced through the use of nurse care coordinators, case managers and telehealth  
- Patients can access their EHR, view Internet-based lab results, get clinical reminders, self-scheduling, secure e-mail with providers, prescription refills, and educational content  
- Web portals facilitate data sharing between fragmented providers  
- EHR available to non-Geisinger referring physicians and patients through customised Web portals  
- Regular practice-level performance reports and meetings to monitor results and drive improvement  | U.S. Department of Veteran’s Affairs |
| 2. Mobile care delivery platforms | - Computer on Wheels (COWs): WiFi-enabled notebooks on mobile trolleys, which enable clinicians to access patients’ medical records and document patients’ progress electronically anywhere, any time.  
- Mobile Electronic X-Ray Computing (MERC): MERC is a motorised WiFi-enabled system which enable patients’ electronic medical records to be displayed across different screens. Clinicians can access these records and images wirelessly at the patients’ bedside to explain various therapies and clinical options to them. | SingHealth |
| 3. Integrated ecosystem | - Narayan’s process innovations include  
- Highly standardised processes and protocols  
- Assembly-line inspired surgery procedures  
- Rightsizing of clinical workforce  
- This enables Narayan to provide specialised care with quality outcomes that rival those of the UK and US at a fraction of the cost. | Geisinger |
| 4. 360 degree view of consumers | - Patients have 24/7 access to care services, enhanced through the use of nurse care coordinators, case managers and telehealth  
- Patients can access their EHR, view Internet-based lab results, get clinical reminders, self-scheduling, secure e-mail with providers, prescription refills, and educational content  
- Web portals facilitate data sharing between fragmented providers  
- EHR available to non-Geisinger referring physicians and patients through customised Web portals  
- Regular practice-level performance reports and meetings to monitor results and drive improvement | Geisinger |
| 5. Agile workforce management | - Narayan’s process innovations include  
- Highly standardised processes and protocols  
- Assembly-line inspired surgery procedures  
- Rightsizing of clinical workforce  
- This enables Narayan to provide specialised care with quality outcomes that rival those of the UK and US at a fraction of the cost. | Geisinger |
### EXHIBIT 31

**Best-practice examples of how ICT capability requirements can be addressed (2 of 3)**

<table>
<thead>
<tr>
<th>ICT requirements</th>
<th>Best practice example</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Timely and trusted clinical insights</td>
<td>IBM Watson advanced analysis (including natural language analysis) to provide clinical decision support for complex / rare conditions</td>
<td>IBM Watson</td>
</tr>
</tbody>
</table>
| 7. Timely and trusted operational insights | • Adjust staffing levels to fit actual work load by hour, day and week  
• Clean up physician schedules to focus on one task for at least 2 hours at a time  
• Fix the basics of patient flow: triage, rounds and discharge procedures  
• Visualise actual cost of diagnostics  
• Use nursing homes for long-stay/low-complexity patients to free-up time  
• Zone in on bottle necks to free resources – parallel processing, mobilising teams for fast clean-up, formalise responsibility for 'boring' little tasks | Swedish University Hospital |
| 8. Business process efficiency | • The Older Persons Assessment and Liaison (OPAL) Team was created. Responsible for  
— OPAL screening all acute medical patients over 70 years within 24 hours of admission  
— OPAL developed list of screening criteria and indicators of prolonged length of stay; risk factors for poor outcomes (depression, falls, poor vision)  
• Mean LOS fell by 4 days post-OPAL  
• Time from admission to transfer to geriatric ward fell from 10 to 3 days | Guy’s and St Thomas’ |
| 9. Performance transparency | • Utilise a common set of metrics to develop uniform reports, which measure clinical quality, patient safety, service performance, and efficiency  
— Information used as a lever for change  
— Clinicians’ relative performance is benchmarked against one another, harnessing peer pressure  
— Challenges performance through quality committees  
— Enables incentives such as performance-related pay | Optum Insight |
| 10. Business intelligence | • Optum Insight provides analytics (based on United’s extensive claims data) & business intelligence to stakeholders across value chain  
• Patient values from laboratory and EHR (Kaiser HealthConnect) data used for analysis  
• Created a risk model based on inputs from regional patient registries  
• Used model to calculate Kaiser patient risk factors for disease progression based on model  
• Risk stratified Kaiser based on chronic kidney disease (CKD) severity  
• Prioritised order of patient referrals to nephrologists according to risk stratification | KP Kaiser |

### EXHIBIT 32

**Best-practice examples of how ICT capability requirements can be addressed (3 of 3)**

<table>
<thead>
<tr>
<th>ICT requirements</th>
<th>Best practice example</th>
<th>Company</th>
</tr>
</thead>
</table>
| 11. Integrated workspaces | • Use customised EMR system that allows all physicians to access patient files, offering seamless access to patient information at every Chen Medical Center and JerCare Neighborhood Medical Center.  
• Smartphone integration allows on-call physicians remote access to all pertinent patient data  
• Chen Hospital Systems operates an inpatient-outpatient Twitter function; inpatient physicians are able to submit real-time clinical data feeds to outpatient primary care physicians so that inpatient care can be managed closely. | Chen Hospital Systems |
| 12. Consistent and exchangeable data structures | • Single-pan organisation, HIS incorporating EMR, inpatient/outpatient management, registration, and billing  
• Standardised clinical content (coding and terminology), pathway management tools, and decision support across >30 medical centers and >450 medical offices | NHS |
| 13. Secure communication | • The NHS consists of over 21,000 individual organisations providing care across the country through primary and secondary care sites, pharmacies, opticians, dentists etc.  
• NHS Spine enables healthcare professionals across NHS to rapidly access and exchange critical information.  
• Security infrastructure to ensure access of data by right staff  
• Secure Electronic File Transfer (SEFT) allows transfer of data to and from any external organisation electronically and securely | NHS |
| 14. Reliable systems | • NHS Spine is used and supported 24 hours a day, 365 days a year and is highly resilient | NHS |
| 15. Usable, flexible and scalable systems | • KP HealthConnect is single pan organisation HER system with region specific instances to meet local needs. It has standardised clinical content, workflow procedures, charting tools and decision support rules shared across all regions | NHS |
End of report