

Queensland Health eHealth Strategy

12 September 2006

NOTE

In 2006 Queensland Health sought expert assistance in the development of its eHealth Strategy. Deloitte responded to a public tender process and were selected to provide this assistance.

The attached document was developed by Deloitte in consultation with Queensland Health for the purposes of informing the department's eHealth Strategy. As would be expected, Queensland Health have progressed the strategy through their implementation planning. As a result, particular sections of the original deliverable have been superseded. To avoid confusion, these have been removed. Elsewhere in the document, Queensland Health have updated comments that reflect progress made since the development of this document and has ensured consistency with the funding cycle of the Queensland Government.

We understand that the plan for how Queensland Health will be implementing their overall eHealth Strategy will be through the department's Information Management Strategic Plan which will be published in June/July 2007.

Contents

1	Executive Summary	5
	1.1 Foreword	5
	1.2 Information as a key enabler of change	6
	1.3 Current issues & trends	6
	1.4 eHealth Vision	7
	1.5 Implications for patients and clinicians	8
	1.6 eHealth Capabilities to enable the vision	9
	1.7 Building Capability	9
	1.8 eHealth Program of Work	10
	1.9 Migration Plan	11
	1.10 Program risks	11
	1.11 Sourcing Strategy	12
	1.12 Next Steps	14
2	Foreword	15
3	Challenges and priorities	17
	3.1 Strategic Drivers	17
	3.2 Queensland Health's responses to these challenges	18
	3.3 Current issues	19
4	Trends in eHealth	21
5	eHealth vision	25
	5.1 The need to support a new model of care	25
	5.2 Patient-centric networked model of care	26
	5.3 eHealth capabilities that enable the vision	28
	5.4 Potential benefits	31
6	Current state	32
	6.1 Capability 1: Integrated and comprehensive patient information	32
	6.2 Capability 2: Consolidated information to support decision making	33
	6.3 Capability 3: Optimised scheduling of resources around patient need	34
	6.4 Capability 4: Supporting delivery of location-independent health services	35
7	Recommended approach for implementing the eHealth vision	36
	7.1 Principles for implementation	36
	7.2 Recommended Approach	36
8	eHealth Program of work	39
	8.1 Program overview	39
	8.2 Portfolio 1: Information Integration and Communication	42

8.3 Portfolio 2: Core Systems Implementation	46
8.4 Portfolio 3: Foundation Projects	53
8.5 Portfolio 4: Managing and Delivering the Program	56
8.6 Program Risks	64
9 Sourcing strategy	68
9.1 Sourcing Strategy overview	68
9.2 Sourcing models	69
9.3 Skill requirements	71
9.4 Sourcing framework	72
10 Program governance.....	74
11 Next steps	76
11.1 Design and operationalise the governance model	76
11.2 Develop the business case	77
11.3 Develop the enterprise architecture	78
11.4 Conduct information repository technology market study	78
11.5 Kick-off feasibility assessments	79

'Deloitte' refers to the Australian partnership of Deloitte Touche Tohmatsu and its subsidiaries. Deloitte, one of Australia's leading professional services firms, provides audit, tax, consulting, and financial advisory services through around 3000 people across the country. Focused on the creation of value and growth, and known as an employer of choice for innovative human resources programs, we are dedicated to helping our clients and our people excel. For more information, please visit Deloitte's web site at www.deloitte.com.au.

Deloitte is a member of Deloitte Touche Tohmatsu (a Swiss Verein). As a Swiss Verein (association), neither Deloitte Touche Tohmatsu nor any of its member firms has any liability for each other's acts or omissions. Each of the member firms is a separate and independent legal entity operating under the names "Deloitte," "Deloitte & Touche," "Deloitte Touche Tohmatsu," or other, related names. Services are provided by the member firms or their subsidiaries and affiliates and not by the Deloitte Touche Tohmatsu Verein.

Liability limited by a scheme approved under Professional Standards Legislation.

Confidential - this document and the information contained in it are confidential and should not be used or disclosed in any way without our prior consent.

© September 2006. All rights reserved.

1 Executive Summary

1.1 Foreword

The eHealth Strategy and roadmap has been developed through extensive consultation over a 5 month period with a broad group of stakeholders including members of the Director General's Clinical Advisory Group, the eHealth Advisory Group (a new reference group of practising clinicians) and a large number of representatives from various business units within Queensland Health.

All staff within Queensland Health were given the opportunity to review and provide feedback on the broad direction of the strategy that was published on the Queensland Health intranet (QHEPS) and to provide feedback.

For the purposes of this strategy eHealth incorporates the following:

- Clinical order entry
- Results reporting (e.g. Pathology, Diagnostic Imaging, Clinical Measurements)
- Decision Support
- Medications management
- Pharmacy
- Clinical documentation
- Patient Management and Coordination (including Scheduling and Booking)
- Emergency Information Management
- Mental Health
- Community Health
- Chronic disease management.

In addition, the integration to specialty care systems and line of business applications (eg. Intensive Care (ICU), Anaesthetics, Oncology and Cardiology) is considered a core component of eHealth for the purposes of the eHealth Strategy. However, the implementation of these speciality and line of business solutions is not considered part of the scope of the eHealth Program and would be subject to current governance arrangements for approval, funding and implementation (*Update comment: May 2007 – now within scope*). Similarly, the implications of the eHealth Strategy on infrastructural components such as network, data centre and access devices is not considered within the scope of the eHealth Strategy (*Update comment: May 2007 – now within scope*), but rather has been addressed within Queensland Health's broader infrastructure plan.

1.2 Information as a key enabler of change

Environmental forces such as an ageing population and a fast growing constituency combined with a global shortage of trained resources is posing increasing pressure on Queensland Health to deliver more with less. Clinicians and those involved in the provision of care are feeling this pressure as are those responsible for managing patient flow where the demand exceeds both physical and human resource capacity.

Recommendations arising from a number of recent reviews identified the need to create capacity within the Department and ultimately improve quality of care and patient safety. The Forster review acknowledged information as a key enabler in the delivery of health outcomes within Queensland.

Queensland Health sought assistance from Deloitte to develop an eHealth strategy that explores how information can support the organisation in responding to these strategic and operational challenges. Service planning principles drawn from the State-Wide Services Plan have guided the development of the eHealth strategy including:

- improve population health outcomes
- patient-focused
- safe services
- quality services
- accessible services
- sustainable services.

1.3 Current issues & trends

The eHealth strategy aims to address a number of issues currently being faced by people who provide care to patients and those who support them. The key issues can be summarised as follows:

- Improved ability to access information that is integrated and accurate
- Better support for clinicians and care providers from across the health system to interact more efficiently and effectively with each
- Support for clinical and managerial decision making
- Greater capability for managing patient flow through improved planning and scheduling
- Support for location-independent health service delivery.

A look at trends in Australia and overseas highlights that usage of information and technology in healthcare lags behind other industry leaders. The health care system is complex which may in part explain why it has been relatively unaffected by the revolution in information technology experienced in other industries. Recognised as a complex adaptive system, healthcare delivery involves many people and many interactions that are non-linear, resulting in patterns of self-organisation, emergence and co-evolution. However progress is being made in the adoption of information and technology in other jurisdictions and the benefits are starting to be evidenced.

According to the US Institute of Medicine, if substantial improvements in quality are expected over the near term, information and technology will need to play a central role in

the redesign of the health care system. Being able to take advantage of advances in IT is seen as a catalyst in the process of change that will reduce the stress being imposed on current systems of care and provide a higher level of quality.

1.4 eHealth Vision

While there is a need to support the ongoing information needs of the health care institutions, the challenges facing Queensland Health require a change in primary focus away from the institution. Instead, the focus of information systems and processes needs to be centred around the patient and focused on equipping clinicians and other care providers who across the health care system, with relevant, comprehensive and accurate information.

Two common issues have been highlighted from a review of global trends in eHealth and assessment of the challenges currently facing Queensland Health:

- **Access to integrated patient information** – as care becomes more complex, and diagnosis and treatment becomes more fragmented into specialty areas, there is increasingly a need for a patient-focused view of information. Such a view would provide care providers at each point of care delivery with all the relevant information to support treatment decision making, and ensure safe and effective care delivery.
- **Support for care delivery across a network of care providers** – increasingly, care is being fragmented into more and more specialised areas, some of which are provided within different Queensland Health facilities and some which are provided by external providers such as clinical specialists, Non Government Organisations and General Practitioners. The need for improvements in this area is also recognised by Queensland Health's partners. For example, in their partnership agreement with Queensland Health, the Queensland Division of General Practice ranks information management as a key priority.

The eHealth vision is to enable a patient-centric focus to health care delivery across a networked model of care. Figure 1 visually depicts the shift from an environment that is fragmented to one where the network of providers is able to access and share relevant information about a patient as appropriate.

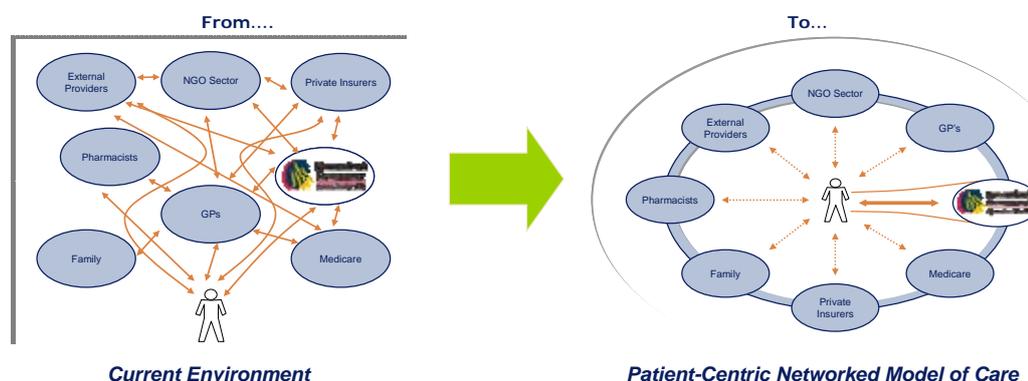


Figure 1: Moving to a networked model of care

1.5 Implications for patients and clinicians

From:	To:
<p><i>Patients</i></p> <ul style="list-style-type: none"> • Patients are the 'messenger' – carrying test results, referrals and supporting information from one provider to the next • Patients have to juggle multiple independent appointments • Patients are passive 'passengers' in their treatment • Chronic care patients are heavily dependent on health-care providers to monitor their condition and update progress 	<p><i>Patients</i></p> <ul style="list-style-type: none"> • No need for patients to carry physical records - confident that relevant information can be accessed electronically by their provider • Number of trips minimised, with treatment streamlined for complex, multi-stage procedures • Patients empowered to play an active role in managing their health • Chronic care patients (e.g. patients with diabetes) can provide regular health-related updates online
<p><i>Queensland Health Care Providers</i></p> <ul style="list-style-type: none"> • Providers work with incomplete and unreliable information to support treatment decision making • Sharing of information with other providers, either internal to Queensland Health or with external partners, is limited 	<p><i>Queensland Health Care Providers</i></p> <ul style="list-style-type: none"> • Providers can access more complete and accurate patient information • Sharing information with each other, and with external partners, is easier and supports greater collaboration within new models of care
<p><i>General Practitioners</i></p> <ul style="list-style-type: none"> • Accessing relevant information about the patients' treatment within Queensland Health is difficult • Sharing the patient information captured during primary care with the acute sector to assist treatment is limited 	<p><i>General Practitioners</i></p> <ul style="list-style-type: none"> • Comprehensive and reliable discharge summaries enable GPs to better understand the treatment history and care plan for their patients • GPs can communicate information to providers within acute and community environments to support patient care.
<p><i>External Providers (Private Hospital, NGO)</i></p> <ul style="list-style-type: none"> • Transferring patients, and supporting information (e.g. care plans), between Queensland Health and external providers is time consuming • Accessing information about their patient's treatment within Queensland Health is limited for external providers 	<p><i>External Providers (Private Hospital, NGO)</i></p> <ul style="list-style-type: none"> • Enhanced capability to support transfers of patients between facilities to enable greater partnerships between private and public providers. • External providers are able to access information about the treatment of their patients within the acute sector (e.g. details of Emergency department treatment, medication information relating to a patient stays in an Intensive Care unit)

1.6 eHealth Capabilities to enable the vision

Queensland Health requires four key capabilities in order to achieve this vision of a patient-centric networked model of care including:

- integrated and comprehensive patient information, including:
- consolidated information to support decision making in areas such as:
- optimising scheduling of resources around patient need with a focus on:
- supporting delivery of location independent health services in two ways.

Achieving the vision of the patient-centric model of care can deliver benefits in the following areas:

- patient safety
- quality of care
- effectiveness
- patient outcomes
- efficiency.

1.7 Building Capability

Consultation with key stakeholders identified a number of principles that guided selection of the most appropriate approach for building information and technology capability within Queensland Health.

The principles for the implementation of the eHealth Strategy are:

- Build on what exists today and re-use viable capabilities in place
- Establish solid functionality and information, and then build new capabilities
- Introduce new and extended capabilities in phases, and realise benefits incrementally
- Identify solutions that improve quality of care and patient outcomes, while easing the workload burden on care providers
- Implement simple and practical solutions that can be refined over time.

Two options were considered:

- Approach 1 (or 'Incremental' approach)
- Approach 2 (or 'Big Bang' approach).

Of the two options considered, the incremental approach was recommended, and subsequently endorsed by the Queensland Health Executive Management Team. The primary focus within this approach is to draw together information from key source systems early to provide an integrated view of patient information.

The incremental approach decouples information from functionality – separating information required to meet business needs from the applications that process that information. Rather than delivering large and complex applications such as a Clinical Information System to meet the informational needs of stakeholders, these informational needs are met by the integration of existing information sources to an Enterprise Information Repository. In this

way, capability can be delivered earlier and more incrementally than a traditional large-scale systems implementation. The incremental approach also recognises health care as a complex adaptive system and enables the eHealth Strategy to be evolutionary and adapt as new evidence emerges and requirements change.

1.8 eHealth Program of Work

The program of work is built upon a high level assessment of systems currently in place at the enterprise level and in cases where appropriate, at the line of business level that support clinicians in the delivery of care. Building on systems currently available, the program of work defines a set of initiatives through which to deliver the capability necessary to achieve the eHealth vision.

A number of initiatives will need to be undertaken in order to deliver the eHealth vision and capabilities. The proposed program of work involves over twenty streams of work being executed over a 5 year timeframe. These initiatives are grouped into four portfolios as follows (*Update comment: May 2007 – a revised portfolio structure is under review*):

- **Portfolio 1: Information Integration and Communication** is focussed on providing integrated patient information to care providers with Queensland Health and facilitating the exchange of information between Queensland Health and external providers such as GPs. Included in this portfolio are the following initiatives:
 - Enterprise information repository
 - Systems integration
 - User portals
 - Information communication
- **Portfolio 2: Core Systems Implementation** focused on selecting, developing and implementing core systems incorporates:
 - Medications reporting
 - Emergency information management
 - Diagnostic imaging
 - Community health, mental health and chronic disease management
 - Patient management and coordination
 - Analysis and reporting
 - Clinical management (including eOrders and ePrescribing)
- **Portfolio 3: Foundation Projects** implements functionality and information management practices that provide a foundation for the eHealth program, including:
 - Information management
 - Unique patient identifier
 - Unique provider identifier and service catalogue
- **Portfolio 4: Managing and Delivering the eHealth Program** aimed at preparing Queensland Health and its people for the significant change that will be delivered through the eHealth vision. This initiative covers:

- Change leadership
- Business and clinical alignment
- Business transition and sustaining the change
- Benefits realisation
- Program management office and architecture
- Quick wins.

1.9 Migration Plan

(Update comment: May 2007 – The plan for how Queensland Health will be implementing the overall eHealth Strategy will be published in the Information Management Strategic Plan in June/July 2007).

The migration plan defines the timing and sequencing of initiatives and portfolios that make up the program of work. The migration plan is based on high-level assumptions, broad activities and major dependencies between initiatives. It is intended to be indicative only and its primary purpose is to inform the broad program budget, resourcing and sourcing strategy.

Designed within a 5 year timeframe, the migration plan aims to deliver visible outputs to clinicians at 6 monthly intervals. Based on feedback from the eHealth Advisory Group and the perception of key stakeholders regarding the organisation's appetite and readiness for change, the plan is 'front loaded' - ensuring that the major factors driving sequencing and timing within the plan are availability of funding and organisational priority. It is recognised that in finalising the sequencing and scope of the program other factors will need to be reviewed in addition to these prioritisation criteria – in particular the organisation's capacity to manage and absorb change of the magnitude envisioned by the eHealth Program scope.

As appropriate activities within each initiative adopt a similar process pattern, summarised by the following high-level steps:

- Determine Strategy – which involves analysing options and developing recommendations regarding the proposed strategy for a given initiative
- Review / Assess – which involves reviewing existing capabilities and determining the extent to which these can be leveraged or used to inform the activities within a given initiative
- Select – which involves defining detailed requirements and selecting an appropriate solution through the relevant procurement process
- Design & Build – which involves designing, building and testing the solution
- Implement – involves deploying the solution into operational environments and training end-users on the use of the solution.

1.10 Program risks

The eHealth program will be a complex undertaking and will require active risk management to ensure that the target outcomes are delivered. The migration plan and next steps outlined in this report have been developed with a view to mitigate the key risks identified to date. Each risk summarised below has been rated as high, with a high likelihood of occurrence and

with the potential if not mitigated to pose significant challenges on Queensland Health. The risks are summarised as follows:

- Inability to secure sufficient funding to invest in eHealth and associated change activities
- Inability to meet expectations – both internal and external (including community, GPs / external providers, industry /vendors, politicians)
- Capacity of Queensland Health to deliver a program of the complexity of the eHealth program
- Solutions designed (both technology and processes are not relevant to clinicians and do not add value to their roles / clinical practice
- Inability of the organisation to absorb change (magnitude / rate)
- Not delivering early enough or fast enough
- Perceptions of Information Division credibility and reputation.

1.11 Sourcing Strategy

Access to sufficient capacity of suitably skilled resources is a necessary pre-requisite to successfully implementing the eHealth vision and realising the associated benefits. Delivery of the program of work will require highly skilled resources across a range of competency domains some of which reside in-house but not to the level that is required, whereas in other cases, QH has no existing resource base on which to draw.

The lack of access to appropriate levels of capacity poses a major risk for the eHealth program. To address this risk, Queensland Health is considering a range of options for sourcing appropriate levels of capacity and capability to supplement the skills currently residing with the department. These models include:

- **In-sourcing** – building up additional internal capacity and capability through the recruitment, retention and re-training of staff either on contract or permanent basis
- **Out-sourcing** – contracting external service providers to take responsibility for the provision of skilled resources or delivery of discrete components of the eHealth program of work
- **Co-sourcing** – partnering with service providers to form joint teams of resources with a view to building internal capability and expertise through knowledge transfer.

No single model is best suited to meeting all resource requirements, rather a combination of sourcing models in different skill domains will be required to meet the resource capacity required.

There are a number of key factors that need to be considered when determining whether to in-source, co-source or out-source. These factors form the basis of the sourcing framework that is the vehicle used to determine the Queensland Health sourcing strategy. These factors are:

- **Strategic Importance** – To what extent does this capability directly impact customer relationships and healthcare outcomes
- **Insourcing** – To what extent does Queensland Health need to have in-house resources performing this capability in the medium term (1 - 2 years)
- **Current State** – How well is Queensland Health able to provide this capability given the current maturity level / demonstrated track record and the capacity to resource this capability to the levels required
- **Ability to staff** – To what extent can Queensland Health recruit staff (i.e. find staff in the market with the required skills) and retain staff to support this capability
- **Vendor Capability** – How well can the external vendor community support this capability from a breadth and depth of skills perspective, ignoring capacity.

Consideration of these factors for each of the required capabilities will allow Queensland Health to determine the preferred sourcing model to be adopted. The various factors that influence the particular sourcing model to be adopted for the different skill domains form the basis of a sourcing framework that can be analysed to identify the preferred sourcing model or models. The development of a sourcing framework for Queensland Health and the associated analysis and recommendations are discussed in Addendum 1 to the eHealth Strategy.

1.12 Next Steps

The eHealth strategy and roadmap brings this initial phase of work to completion. Significant progress has been made in engaging stakeholders as evidenced by the constructive input received from the eHealth Advisory Group as well as by the broadly positive feedback received via the intranet site where Queensland Health staff were invited to comment on the highlights of the strategy. The momentum gained through this phase indicates that people who have been exposed to the strategy are embracing the vision for eHealth.

Before the program of work can be established, there is a need to obtain endorsement and appropriate levels of funding. A period of time is likely to elapse between the end of this phase and the start of the eHealth program. A period of inactivity in the time between the end of this phase and the start of the program could break the momentum that has been gained and any opportunity to complete the necessary pre-work would be lost.

There are a number of prerequisites that should be completed prior to embarking on delivering the eHealth agenda. Additionally there are a number of activities that if fast tracked, could significantly improve the establishment of the program. These activities are critical to maintain the momentum created in the current phase, whilst appropriately establishing a foundation for the broader eHealth program. A number of initiatives have been identified as follows:

- Design and operationalise the governance model
- Develop the business case
- Develop the enterprise architecture
- Assess data repository trends
- Kick-off feasibility assessments.

2 Foreword

The eHealth Strategy project was conducted over a five month period commencing on 19 April 2006 and concluding with the presentation of the eHealth Strategy to the Queensland Health Executive Management Team on 20 September 2006.

Throughout this period, the engagement team consulted extensively with a broad group of stakeholders including members of the Executive Management Team, members of the Director General's Clinical Advisory Group, representatives from both the Clinical Informatics Program and Information Division, and a large number of representatives from the various business units that depend on eHealth capabilities to deliver services to Queensland Health clients.¹

This consultation process also resulted in the formation of the eHealth Advisory Group – a reference group of practising clinicians that have informed the development of the eHealth Strategy and the prioritisation of capabilities delivered by it. In addition, an overview of the eHealth Strategy was published on the Queensland Health intranet (QHEPS) enabling all staff within Queensland Health to review the broad direction of the strategy and to provide feedback to the team.

For the purposes of this strategy eHealth incorporates the following:

- Clinical order entry
- Results reporting (e.g. Pathology, Diagnostic Imaging, Clinical Measurements)
- Decision Support
- Medications management
- Pharmacy
- Clinical documentation
- Patient Management and Coordination (including Scheduling and Booking)
- Emergency Information Management
- Mental Health
- Community Health
- Chronic disease management

In addition, the integration to specialty care systems and line of business applications (eg. Intensive Care (ICU), Anaesthetics, Oncology and Cardiology) is considered a core component of eHealth for the purposes of the eHealth Strategy. However, the implementation of these speciality and line of business solutions is not considered part of the scope of the eHealth Program and would be subject to current governance arrangements for approval, funding and implementation (*Update comment: May 2007 – now within scope*).

Similarly, the eHealth Program includes the delivery of the requisite infrastructure to develop and implement eHealth capabilities, but does not include the delivery of associated infrastructure including network enhancements, security, high-availability environments and access devices. These components have been addressed elsewhere within the scope of the

¹ Further information regarding consultation can be found in Appendix B – Consultation list

overall Queensland Health infrastructure plan (*Update comment: May 2007 – now within scope*).

3 Challenges and priorities

3.1 Strategic Drivers

Queensland Health faces increasing challenges in the delivery of health services to Queenslanders. Increasing incidence of chronic disease, an ageing population and the fastest growing constituency in Australia combine to increase the demand for health care services. The pool of trained resources available for recruitment within the local market is diminishing, mirroring the global shortage of health care professionals. In addition, the costs associated with the provision of health care services continue to rise.

Recommendations arising from the Forster review, the Davies inquiry and the Queensland Health action plan are also driving change within Queensland Health. There is an elevated focus on implementing systemic changes to improve quality of care and patient safety. There is also recognition of the need for new models of care, supported by greater collaboration across the organisation, and with external partners in the health care sector to provide a continuum of care for the patient. As a result, Queensland Health is undergoing change as it moves from operating within institutional ‘silos’ to participating within collaborative networks of care.

The Queensland Health Strategic Plan and the State-wide Health Services Plan (currently under development) are seeking to define how (and where) the organisation will deliver services in the future. Equity of access will be increasingly important as health service planners seek to balance quality and cost of health services, with proximity to patients. There is also a strong focus on improving efficiency and asset utilisation to maximise service capacity and address waiting lists.

Addressing these challenges is the subject of a number of key strategy initiatives within Queensland Health – notably the Queensland Health Strategic Plan and the State-wide Health Services Plan. In line with the Forster review observation that information is a key enabler in the delivery of health outcomes within Queensland², the eHealth Strategy seeks to explore how information can support Queensland Health in responding to these strategic challenges.

² P. Forster, *Queensland Health Systems Review: Final Report*, 2005, The Consultancy Bureau. Chapter 12, p.290

3.2 Queensland Health's responses to these challenges

eHealth acts as a key enabler of a number of Queensland Health's responses to these challenges. Queensland Health strategy documents, such as the Queensland Health Strategic Plan and the draft State-wide Services Plan, identify key ways in which Queensland Health can respond to these challenges in areas such as patient-focus, provision of services, and models of care. The following service planning principles have guided the development of the eHealth Strategic Overview:

Improve population health outcomes:

- Improving the health and wellbeing of the whole population of Queensland; and
- Improving the health of disadvantaged groups, especially the Indigenous population.

Patient-focused³:

- Integration within and across the public, private, non-government and other sectors to facilitate continuity of care;
- Supporting greater health self-management.

Safe services:

- Planning according to the Clinical Services Capability Framework to ensure the provision of safe and appropriately supported clinical services across the state.

Quality services:

- Ensuring clinical practice and models of service delivery are consistent with good practice and Queensland Health policy.

Accessible services:

- Addressing barriers to service access (eg. geography, cultural factors, market forces) while preserving the safety and quality of health service provision.

Sustainable services:

- Developing, configuring and delivering services in a way that is sustainable, making efficient and effective use of scarce resources to maximise capacity to respond to change.

³ For the purpose of the eHealth Strategy, 'patient' includes any person who has previously been treated, is currently receiving treatment, or will potentially receive treatment in the future

3.3 Current issues

In addition to supporting Queensland Health's responses to these strategic challenges, consultation with key stakeholders identified a number of areas for improvement that can be addressed by the eHealth Strategy.

3.3.1 Access to integrated and accurate information

Information systems within Queensland Health have historically been built around facility-centric models of care. With increasing collaboration both within Queensland Health and with external partners, there are significant opportunities to improve patient information so that it is integrated, complete and reliable, and accessible across the continuum of care. Information accessibility issues can also be addressed by ensuring a sufficient number of access devices, such as PCs, are available to staff.

Patient information is fragmented and dispersed across the various providers and institutions within the health sector, with little integration or connectivity to provide a single patient view. Queensland Health providers require better access to relevant, accurate, timely and complete information to support effective clinical decision making. Gaps in system capability, privacy constraints, and issues arising from organisation and institutional boundaries should be addressed in order for providers to have access to the information they need to treat patients more effectively.

Better capabilities are required to support effective interaction and collaboration within Queensland Health. Specific areas where this is evident include patient transfers and referrals, electronic ordering of tests, electronic results reporting and verification that test results are communicated back to the treating provider.

3.3.2 Support for interaction across the network of providers

Major opportunities exist to enhance the capabilities that support effective interaction between health care providers within Queensland Health, and between Queensland Health providers and their external providers, in an increasingly networked and collaborative health sector.

This is particularly relevant in relation to the transfer of patients and patient information between providers, departments and facilities. Improved capabilities to support internal and external collaboration can address current issues in relation to treatment efficiency and effectiveness, as well as patient safety, by enabling referrals to be conducted electronically, providing more systematic and effective hand-over information, allowing GPs to share relevant information about their patient's medical history with Queensland Health and improving the communication of information (such as discharge summaries and test results) to external parties.

3.3.3 Support for clinical and managerial decision making

Significant opportunities for improvement exist in the provision of aggregate patient information for research and longitudinal analysis, supporting clinical practice improvement and population health programs. Such aggregate patient information is also seen as critical in the development and maintenance of clinical pathways and clinician decision support.

There are major opportunities for implementing enhanced capabilities to support performance assessment, reporting and improvement across both clinical and operational domains, based on analysis of aggregate patient and capacity demand information. This includes providing information repositories to support demand modelling, forecasting, and better health service planning.

3.3.4 Scheduling and planning capabilities

Substantial opportunities exist to enhance information and tools that enable patient needs to be effectively matched with available service capacity (people, facilities and equipment) in order to meet increasing demand, and optimise treatment efficiency and resource utilisation.

Opportunities are also present to improve the capability to monitor and communicate availability (e.g. elective surgery waiting lists, emergency department waiting times) to relevant stakeholders including Queensland Health management, the Queensland Government, the general public, and external health care providers.

3.3.5 Support for location-independent health service delivery

Significant areas for potential improvement exist in providing the capability to enable patients to access specialist resources and expertise, without physically travelling to the centres where these services are delivered.

Sharing of patient information across care providers in a location-independent manner can improve the provision of specialist care to patients in remote and rural areas, as well as providing support to care providers in these areas.

4 Trends in eHealth

Research into eHealth trends (both global and local) have been drawn upon in developing the eHealth Strategy. A summary of the key findings from this research is provided below.

‘World’s Best Practice’ is not as advanced as you would think

Adoption of IT in the health sector has been slow. Innovations in IT have improved efficiency and quality in many industries such as financial services, retailing and airlines. Such industries have raised consumer expectations regarding online self-service capability and access to integrated real-time information. However IT usage in healthcare lags behind these leaders⁴. The health care system is complex which may in part explain why it has been relatively unaffected by the revolution in information technology experienced in other industries. Recognised as a complex adaptive system, healthcare delivery involves many people and many interactions that are non-linear, resulting in patterns of self-organisation, emergence and co-evolution. However progress is being made in the adoption of information and technology in other jurisdictions and the benefits are starting to be evidenced. In addition, the opportunity remains to learn from the experiences of other industries.

Many experts believe that the current quality and cost concerns in health can be addressed through the systematic modernisation of the health care industry – based on new and evolving clinical information technology. This technology can provide targeted and timely information at key decision points along the path of diagnosis and treatment, allowing practitioners to deliver more effective and higher quality care, and administrators to more effectively manage their resources and service delivery. According to the US Institute of Medicine, if substantial improvements in quality are expected over the near term, IT will need to play a central role in the redesign of the healthcare system. Being able to take advantage of advances in IT is seen as a critical catalyst and enabling factor in the process of change. The Institute asserts that ‘outmoded systems of work’ contribute to quality issues and that ‘further stressing current systems of care’ cannot lead to a higher level of quality.⁵

The recent eHealth Strategy Study Tour undertaken by senior representatives of Queensland Health has confirmed that even leading eHealth jurisdictions such as the UK, US and Canada have a long way to go to achieve the level of integrated information access and technology-enabled processes found in other industries.⁶

Vendor solutions are not a panacea

The recent experience of the UK NHS with major eHealth vendor iSoft has highlighted the challenges involved in bringing mature commercial solutions to market.⁷ However the NHS is not alone - many jurisdictions have commented on the lack of maturity in commercially available clinical applications.^{8,9} As a result, alternate approaches are emerging including the internal development of applications, as well as the integration of best-of-breed solutions

⁴ Fonkych, K. and Taylor, R. 2005, *The State and Pattern of Health Information Technology Adoption*, RAND Health, RAND Corporation.

⁵ Given, R. 2003, *Clinical Transformation: Cross-Industry Lessons for Health Care*, Deloitte Research.

⁶ *Queensland Health eHealth Study Tour Report*, 2006, Queensland Health.

⁷ Dearne, K. 2006, ‘Dire prognosis for Britain’s health revamp’, *The Australian*, 5 Sept.

⁸ *Queensland Health eHealth Study Tour Report*, 2006, Queensland Health.

⁹ Given, R. 2003, *Clinical Transformation: Cross-Industry Lessons for Health Care*, Deloitte Research, p.6.

with legacy systems.¹⁰ Although not without risk, these interim approaches allow health care organisations to collate existing sources of information and present consolidated patient information – delivering tangible benefits whilst ‘buying time’ as the vendor solution market matures.

eHealth is complex and requires major investment over sustained periods of time

eHealth initiatives have been underway in some countries for a decade or more. Over the last 20 years, France unsuccessfully attempted to create a single structured record for its patients. Yet its Government recently announced a centralised, electronic ‘shared medical file’ program. Between 1998-2002, the United Kingdom touted IT-supported healthcare improvements in no less than 5 plans. It is now investing 6.2B pounds over 10 years in the Connecting for Health program.¹¹ Canada’s C\$1.3B Infoway program aims to promote interoperable healthcare records in place across 50% of its population by 2009. Each of these jurisdictions has found that the complexity of e-enabling the health care system requires major investments in medium-to-long term initiatives.

eHealth investments have generally not been based on detailed benefits analysis

Literature on healthcare benefits is sparse, partly due to difficulties in measuring healthcare productivity.¹² Although many jurisdictions are investing heavily in eHealth, the benefits analysis underpinning these initiatives is relatively high-level. In some cases, attempts to measure the benefits associated with implementing eHealth initiatives have begun after – not before – the implementation itself.

But research backs up anecdotal evidence – showing improvements in quality, safety and efficiency

Notwithstanding the above, industry consensus is growing about the value of clinical information systems in facilitating improved care quality and operational efficiency. Both qualitative and quantitative benefits have been shown to accrue from clinical system implementations - enhancing safe, effective and patient-centred care, while improving resource utilisation. Research has illustrated that even moderate benefit scenarios can result in significant savings when the average 10 – 15% reductions are extrapolated across the massive sector wide expenditure on healthcare.¹³ Benefits that can be realised after implementation include: integrated, multidisciplinary departmental workflow; online immediate access to clinical data; elimination of redundancy, errors, and unnecessary variation; standardised clinical documentation and data; online, just-in-time contextual references; standardised reports for clinical, quality, cost and performance indicators.¹⁴

Access to comprehensive, secure electronic health records has been shown to improve the quality of care and patient safety. Improved knowledge of the patient’s history and previous interventions facilitates appropriate medical treatment.¹⁵ eHealth can also strengthen systems

¹⁰ *Queensland Health eHealth Study Tour Report*, 2006, Queensland Health.

¹¹ *Queensland Health eHealth Study Tour Report*, 2006, Queensland Health.

¹² Bower, A. *The Diffusion and Value of Healthcare Information Technology*, 2005, RAND Health, RAND Corporation.

¹³ Girosi, F., Meili, R. and Scoville, R. *Extrapolating Evidence of Health Information Technology Savings and Costs*, 2005, RAND Health, RAND Corporation.

¹⁴ Williams, B. and Vaz, A. *Promoting Physician Adoption of Advance Clinical Information Systems*, 2006, Deloitte Centre for Health Solutions.

¹⁵ *Strategy 2004-2007, eHealth for Health-care Delivery*, World Health Organisation, Department of Essential Health Technologies.

to reduce medical errors through the provision of vital information, alerts and guidance on best practice.¹⁶

The clinical content in clinical information systems offers the potential to greatly improve the quality of patient care. Early adopters of clinical information systems have already reported benefits related to patient care and reduced expenditures: adverse drug event (ADE) reductions in the range of 55-70% have been reported.¹⁷

Local developments

Within Australia, each state has been progressing their own eHealth agenda in parallel with undertakings of the National E-Health Transition Authority (NEHTA).

In Victoria, the Department of Human Services is investing A\$323M on eHealth through the state-wide HealthSMART program. Expected benefits from the HealthSMART program include¹⁸:

- 43% decrease in turnaround time for radiology results
- 25% decrease in turnaround time for pathology results
- 81% decrease in medication errors achieved from ePrescribing, saving approximately \$380M annually
- Reduction in additional bed days associated with adverse events

There are other examples of target benefits from eHealth initiatives, although these generally relate to specific and detailed instances where technology is able to provide demonstrable benefits. For example, in Western Australia, the Advanced Medical Wound Imaging System provides a previously unavailable level of wound measurement precision and documentation. Wound images and assessment data are securely transmitted to remote facilities for review or consultation. It can provide significant benefits to rural and remote communities that may not have easy access to a wound care consultant. A 2003 study in the Kimberley region examined the clinical outcomes of using the system to undertake remote wound consultation for diabetic Aboriginal people with chronic leg ulcers. It found that clinical outcomes were significantly improved and costs reduced, when this system was used to gain remote clinical consultation from a wound care expert located 2,500 kilometres from the Kimberley region.¹⁹

In another example closer to home, a study by GP Partners on improved care coordination for chronic disease management in Queensland, found that hospital admissions can be reduced by 11% and length of stay reduced by an average of 8 days per patient per year.²⁰

NEHTA is pursuing a national work program to develop a framework and supporting standards for interoperable eHealth capabilities - including a National Shared Electronic Health Record. As these initiatives progress, Queensland Health will be presented with opportunities to be involved with, and potentially leverage, the work being undertaken by NEHTA. In addition, NEHTA's work in undertaking a benefits study to inform the investment decision for a national Electronic Health Record system will be influential in further demonstrating the potential benefits of eHealth investments within Australia. As such, it is important that Queensland Health continues to monitor developments in this area whilst simultaneously progressing priority components of its eHealth agenda.

¹⁶ *Strategy 2004-2007, eHealth for Health-care Delivery*, World Health Organisation, Department of Essential Health Technologies.

¹⁷ *Health Spending Projections for 2002-2012*, 2003, Health Affairs

¹⁸ *Impact of Advances in Medical Technology on Healthcare Expenditure in Australia*, 2004, Victorian DHS, p.34

¹⁹ *Impact of Advances in Medical Technology on Healthcare Expenditure in Australia*, 2004, Victorian DHS, p.34

²⁰ *Targeted Analysis of TCIII Coordinated Care Trial Data – Key Commentary*, 17 March 2006, GP Partners

Common themes in the approaches of other jurisdictions

Recent site visits to major eHealth implementation initiatives in the United Kingdom, the United States and Canada have identified learnings that can inform Queensland Health's eHealth Strategy and vision. Despite significant differences in their approach, a number of common themes were evident in their overall strategies, in particular the focus on patient-centricity and supporting health care delivery within networked models of care.

All three of these jurisdictions are tackling integrated, shareable electronic patient health records as one of their main priorities, albeit in quite different ways. The UK is addressing this challenge by investing heavily in common systems, whereas Canada have adopted a federated, standards based approach to integrating patient records and the US is attempting to achieve the same goal through a largely decentralised approach.²¹ In any event, all three programs see the sharing of patient information with all relevant providers across the continuum of care as fundamental to their strategy of transforming their health sectors through the use of eHealth technology.

²¹ *Queensland Health eHealth Study Tour Report*, 2006, Queensland Health.

5 eHealth vision

5.1 The need to support a new model of care

The assessment of current challenges facing Queensland Health, Queensland Health's response to these challenges and the review of global trends in eHealth highlight two common issues:

- **Access to integrated patient information** – as care becomes more complex, and diagnosis and treatment becomes more fragmented into specialty areas, there is increasingly a need for a patient-focused view of information. Such a view would provide care providers at each point of care delivery with all the relevant information to support treatment decision making, and ensure safe and effective care delivery.

Industries such as financial services and retailing have been integrating data for some time to provide a single view of the customer. This view is shared across the enterprise to support better decision making by various decision makers, and hence enhance service delivery. Many international health initiatives are now focused on providing capabilities to share health information electronically to facilitate safer, more effective care as well as providing the base data to improve service delivery management and clinical practice improvement. Interviews with key stakeholders have highlighted the need for integrated patient-focused information is also a high priority for Queensland Health.

- **Support for care delivery across a network of care providers** – increasingly, care is being fragmented into more and more specialised areas, some of which are provided within different Queensland Health facilities and some which are provided by external providers such as clinical specialists, Non Government Organisations and General Practitioners. The need for improvements in this area is also recognised by Queensland Health's partners. For example, in their partnership agreement with Queensland Health, the Queensland Division of General Practice ranks information management as a key priority.

Industry leaders in IT adoption and innovation such as retailing and airlines have long recognised the need to partner with, and share information among a network of external organisations to satisfy customer expectations in a sustainable way. The trend to deliver health care using a range of service providers and partners is a model that is becoming increasingly common nationally and internationally. It is a model that Queensland Health is moving to embrace more strongly with the State-wide Health Services Plan. To enable effective and safe patient care, there is a need to both acknowledge and support the existence and need for this model of care through a network of care providers. From an eHealth perspective, this model of care can be supported through the sharing of relevant patient- focused information between all care providers within the continuum of care.

Historically, organisations like Queensland Health have focused their information systems and processes on the internal institutions that deliver care, rather than on the patient who is receiving the care. While there is a need to support the ongoing information needs of the health care institutions, the challenges facing Queensland Health require a change in primary focus away from the institution. Instead, the focus of information systems and processes needs to become **patient-centric** and focused on supporting the **networked model of care** through which healthcare services for the patient will be delivered.

5.2 Patient-centric networked model of care

The eHealth vision is to enable a patient-centric focus to health care delivery across a networked model of care. The vision will contribute to an environment that facilitates patient access to services, moving away from one where:

- Patients are required to navigate a complex network of multiple providers
- Patients repeat the same information multiple times and carry the responsibility of determining what information should be shared with whom.

Moving to a patient-centric networked model of care, the eHealth vision is characterised by:

- Collaboration across the multiple provider network for seamless delivery across the continuum of care
- Access to and sharing of relevant patient information with providers as appropriate.

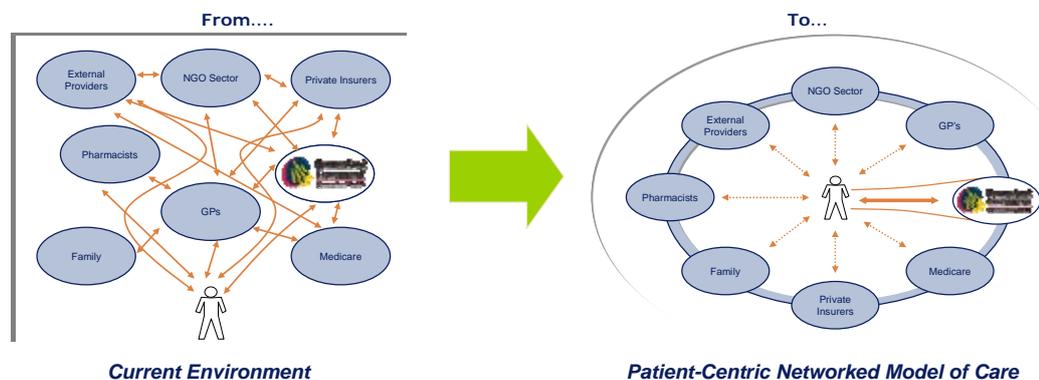


Figure 2: Moving to a networked model of care

5.2.1 Enabling a patient-centric model – what this will mean for patients

Moving towards a patient-centric model will mean the following changes for patients:

From:

- Patients are the 'messenger' – carrying test results, referrals and supporting information from one provider to the next
- Patients have to juggle multiple independent appointments
- Patients are passive 'passengers' in their treatment
- Chronic care patients are heavily dependent on health-care providers to monitor their condition and update progress

To:

- No need for patients to carry physical records - confident that relevant information can be accessed electronically by their provider
- Number of trips minimised, with treatment streamlined for complex, multi-stage procedures
- Patients empowered to play an active role in managing their health

Chronic care patients (e.g. patients with diabetes) can provide regular health-related updates online

5.2.2 Enabling a networked model – what this will mean for health care providers

Providing enhanced capabilities to support the networked model of care will mean the following changes for health care providers.

From:

Queensland Health Care Providers

- Providers work with incomplete and unreliable information to support treatment decision making
- Sharing of information with other providers, either internal to Queensland Health or with external partners, is limited

General Practitioners

- Accessing relevant information about the patients' treatment within Queensland Health is difficult
- Sharing the patient information captured during primary care with the acute sector to assist treatment is limited

External Providers (Private Hospital, NGO)

- Transferring patients, and supporting information (e.g. care plans), between Queensland Health and external providers is time consuming
- Accessing information about their patient's treatment within Queensland Health is limited for external providers

To:

Queensland Health Care Providers

- Providers can access more complete and accurate patient information
- Sharing information with each other, and with external partners, is easier and supports greater collaboration within new models of care

General Practitioners

- Comprehensive and reliable discharge summaries enable GPs to better understand the treatment history and care plan for their patients
- GPs can communicate information to providers within acute and community environments to support patient care.

External Providers (Private Hospital, NGO)

- Enhanced capability to support transfers of patients between facilities to enable greater partnerships between private and public providers.
- External providers are able to access information about the treatment of their patients within the acute sector (e.g. details of Emergency department treatment, medication information relating to a patients stay in an Intensive Care unit)

5.3 eHealth capabilities that enable the vision

Queensland Health requires four key capabilities in order to achieve this vision of a patient-centric networked model of care.

5.3.1 Integrated and comprehensive patient information

The availability of integrated and comprehensive patient information is critical to the achievement of the eHealth vision.

This includes the ability to uniquely identify a patient within Queensland Health and to link information held in subsidiary systems to produce an integrated view of all relevant patient information. The types of information that are required include:

- Patient Biographic / Demographic Information such as patient personal details, family history, lifestyle and allergies
- Diagnostic information such as pathology results, radiology results and clinical measurements (e.g. neurology, cardiology, respiratory)
- Treatment information such as clinical/progress notes, medications, information from speciality care systems (e.g. oncology, ICU, mental health, community health)

The ability to provide integrated and comprehensive patient information will support patient treatment for individual episodes of care through the provision of a detailed Electronic Medical Record (EMR). Summary information will be captured in the patients Electronic Health Record (EHR) to enable various providers to access relevant longitudinal information about the patient's health.

Information about the patient's care plan and schedule of future appointments are also encompassed within this notion of integrated and comprehensive patient information, and should be available across the continuum of care.

5.3.2 Consolidated information to support decision making

There is a widely recognised need, within the stakeholders that were consulted, for increased capabilities in relation to the aggregation of patient information to support both clinical and managerial decision making.

Clinical decision making purposes for which there is an increased need for aggregate patient information include:

- Population and public health – where currently organisational, system and policy barriers constrain the effective linking of patient information to support prevention and screening programs
- Service and clinical practice improvement – where limited access to robust, reliable and consolidated clinical and patient information undermines the ability to conduct appropriate research and analysis to support practice improvement initiatives
- Decision support systems and clinical pathways – whose development and maintenance are dependent upon aggregate patient and clinical information

The ability to provide access to a consolidated information repository is also of critical importance for managerial purposes. Such a resource would enhance:

- Reporting – in terms of organisational outputs and performance, as well as supporting the ability to benchmark against best practice (whether internal or external)

- Planning – by supporting enhanced modelling, demand forecasting and health service planning through the provision of aggregate performance information.

5.3.3 Optimising scheduling of resources around patient need

The patient-centric vision is dependent on the optimised scheduling of resources around patient need. At the macro level, the optimal utilisation of assets can increase service capacity and directly reduce waiting lists. At the micro level, enhanced scheduling improves the safety, treatment effectiveness and overall quality of experience for individual patients (by streamlining treatment and minimising the number of separate visits required).

This capability comprises three separate components.

Service Capacity

This component is focussed on assisting personnel in managing and communicating what services are delivered where, by who, with what and when. Service capacity is defined in terms of people (both volume and capability), as well as the equipment and facilities required in order to provide a given service. These variables need to be understood and managed in order to maximise service capacity at multiple levels including individual units, hospitals/clinics, districts, areas and across the state as a whole. Information about service capacity (including locations and hours of operation) also needs to be published to a wide range of stakeholders, both internal and external to Queensland Health, to inform providers and patients and support them in making decisions about patient care.

Service Availability

Service availability relates to the information and tools required to understand and manage utilisation of resources and available capacity. This is applicable in both an operational ‘day-by-day’ basis, managing the available capacity within a given facility to meet current demand, as well as long-term planning and resource allocation to monitor and address waiting lists.

Scheduling

Enhanced information and tools are required in order to improve the scheduling of available capacity, prioritised around patient need and readiness. Scheduling capabilities will need to be enterprise-wide, and integrated with patient administration systems, in order for assets to be utilised to their optimum capacity and treatment of patients to be conducted efficiently with a minimal number of admissions. Improved capabilities in this area will enable service managers to optimise the scheduling of people, equipment and facilities to respond for complex, multi-step procedures, whilst improving patient throughput and reducing end-to-end treatment timeframes.

5.3.4 Supporting delivery of location-independent health services

Another key capability underpinning the eHealth vision is the ability to deliver health services independent of location.

By providing state-wide access to patient and clinical information, and through the use of enabling tele-health technology and supporting infrastructure, Queensland Health will be better positioned to deliver equitable health services to Queenslanders and minimise the need for patients to travel to major metropolitan centres.

This capability will be manifested in two ways:

- Diagnostic services – shared patient information in conjunction with capabilities such as tele-radiology will augment the existing state-wide pathology service and enable local providers to receive expert advice and support regarding the diagnosis of their patients from anywhere in Australia
- Treatment services – through tele-health technologies and collaborative web or video conferencing, will enable more and more conditions to be treated locally with support from remote experts (supported by state-wide access to relevant patient information)

5.4 Potential benefits

Achieving the vision of the patient-centric networked model of care can deliver benefits in the following areas:

5.4.1 Patient safety

Greater access to integrated patient information will enable care providers to have more complete information about the patient (including patient and family medical history, allergy information, medication history and other relevant patient information). In conjunction with decision support capabilities (such as ePrescribing and clinical pathways), this capability can reduce the likelihood of adverse events due to allergies and drug interactions. In addition, the impact of enhanced scheduling upon service capacity and waiting lists can reduce the number of adverse events that occur as a result of delays in patient treatment.

5.4.2 Quality of care

The ability to analyse aggregated patient information across multiple institutions and care providers will provide a basis for identifying areas in which clinical practice improvement may be beneficial. Decision support capabilities will enable Queensland Health to provide greater guidance to care providers in relation to best practice and established clinical pathways. The use of such tools will help to improve the consistency of treatment across the organisation, providing the ability to review that any deviations from clinical pathways are made consciously. In addition, process assurance capabilities will validate whether test results (and in particular, adverse test results) are communicated to the treating provider.

5.4.3 Effectiveness

Access to integrated patient diagnostic and treatment information, coupled with decision support capabilities such as clinical pathways, can enable care providers to make more informed care decisions and enable them to deliver more effective treatment to their patients, by leveraging best practice guidelines.

5.4.4 Patient outcomes

In addition to patient safety and effectiveness, additional outcomes can be achieved for patients. The ability to provide integrated patient information available across the network of providers can reduce patient anxiety, with patients having increased confidence that their care providers have access to more complete and reliable information to support their healthcare needs. The provision of self-management capabilities can enable patients to be better informed, feel more in control of their healthcare and able to participate in the management of their health to a greater extent.

5.4.5 Efficiency

Enhanced scheduling capabilities can increase the utilisation of key assets (such as expensive diagnostic imaging equipment), thereby increasing overall service capacity. In addition, automating or streamlining non-value adding activities (such as ordering, booking and scheduling) can increase the service capacity of care providers, allowing them to spend a greater proportion of their time on patient care.

6 Current state

6.1 Capability 1: Integrated and comprehensive patient information

Current State

Patient information exists in a multitude of systems across the state, and capability to uniquely identify patients between them is not in place. Within acute facilities, and between acute and non-acute facilities patient information is not shared. Significant parts of the organisation do not have a single, consistent system (eg. Community Health). Over time, a single patient may have numerous application-specific identifiers created in different systems, such as Patient Administration, AUSLAB, community health, and speciality care systems. The Client Directory project intends to provide functionality to match identifiers from various systems, and therefore enable unique patient identification.

Electronic reporting of pathology results is delivered on a state-wide basis through the AUSLAB application. The ability to perform electronic reporting of diagnostic imaging results varies across the state. The QRiS project aims to deliver a Radiology Information System with standardised data definitions and management practices, and web access to provider reports, patient schedules, and where applicable electronic radiology images (PACS) to all medical imaging services.

Medications management capability is supported in part by the eLMS, and iPharmacy systems. These systems allow the enterprise to manage and share patients' medication-related information, and manage hospital pharmacies. Projects are currently underway to enhance iPharmacy, and roll-out eLMS as an enterprise-wide application.

EHR and discharge summary functionality have been piloted in two HealthConnect trials. A range of projects may deliver longitudinal records capability e.g. projects in Community Health, Mental Health, Chronic Disease Management. A new project defining discharge summaries is in concept stage and may provide the basis for discharge summary design.

Building on What Is There

To facilitate the capture and sharing of integrated and comprehensive patient information, delivery of the Client Directory project will allow a patient registered in one system to be matched with other registrations created for them in other systems around the state. Picture Archiving and Communications Systems, and Radiology Information Systems should provide a common level of functionality to all medical imaging services in the state. Achieving a common level of functionality may be best achieved via a state-wide solution. Medications management capability should be extended to include ePrescribing and decision support. EHR and discharge summary functionality should be standardised (e.g. to ensure a minimum safety data set is provided) and rolled-out on a state-wide basis.

6.2 Capability 2: Consolidated information to support decision making

Current State

A number of projects are underway to improve the capture, management and usage of data to support clinical and managerial decision making. Some projects intend to upgrade existing systems, while others are introducing new systems across Queensland Health. The Queensland Cancer Registry QCATT project for example, seeks to address the information needs of population and public health by establishing a system for the routine collection of cancer staging data.

Service and clinical practice improvement is being supported by various projects. Areas of improvement include incident reporting and management, and management of specific chronic diseases. One project for example, aims to facilitate incident reporting with the introduction of an online monitoring system, which collects patient-related incident data entered directly by staff. The enterprise-wide Renal Patient Database and EHR project aims to provide a tool for management of chronic kidney disease for early prevention, service planning, education and quality assurance. Projects are also underway to review and upgrade legacy clinical decision support systems, such as the Clinical Indicators and DSS HOLOS projects.

A range of stand-alone systems support the planning and reporting cycle. Reporting against indicators requires a degree of manual collation and standardisation of data from multiple systems.

Building on What Is There

While there are numerous systems in place with ‘islands of information’ which aim to support specific areas of care and decision making, and a variety of projects underway which intend to increase data collection and/or functionality, additional value can be derived by sharing data captured in each system across facilities and services within, and external to, Queensland Health. A patient-centric view of data, and an understanding of a patient’s journey in a variety of scenarios, should drive the information sharing approach. The networked model of care should also be considered to understand which decisions may be made by certain care providers over time, where master sources of data (‘sources of truth’) should reside, and to what extent data should be integrated to provide certain information.

Such considerations can ensure that the sequence and timing of multiple systems implementations, upgrades, replacements and enhancements are coordinated, and account for dependencies critical to successful interoperability.

6.3 Capability 3: Optimised scheduling of resources around patient need

Current State

Rostering systems currently exist to schedule staff. The Environment for Scheduling Personnel and eXpert Rostering Generation systems are among several applications which provide an ability to schedule staff, generate rosters, and determine staff and productivity levels.

Some projects, either in conception or implementation stages, seek to address the issue of scheduling patients and patient treatments in different scenarios. The Enterprise Scheduling project for example aims to facilitate alignment of supply and demand at the enterprise level to utilise resources more efficiently. The project aims to help ensure patients are referred and scheduled on a needs basis, with availability of services taken into consideration. The QRiS project, which aims to deliver Radiology Information Systems, is more specific in its focus on patient scheduling. It intends to provide access to diagnostic imaging patient schedules, among other imaging functionality.

Building on What Is There

A system providing an enterprise view of scheduling demands, and capacity which may satisfy such demands, should aim to assist patient treatment to be delivered in the right sequence, and at the best possible time. It should also ensure use of the most appropriate human and physical resources available at a given point in time (e.g. matching resources to patient need).

The Enterprise Scheduling project should deliver a system with the capability to utilise data from feeder systems which manage resources with their own scheduling capability (e.g. rostering, diagnostic imaging appointments), manage conflicts, provide best-case alternative schedules, and cater for flexibility and the need to change patient schedules. Feeder systems should be able to provide a minimum set of scheduling data sufficient for an enterprise scheduling system to use in providing a useful view of service capacity.

6.4 Capability 4: Supporting delivery of location-independent health services

Current State

Delivery of location-independent health services can be enabled by remote access to services and expertise not commonly available across all Queensland Health facilities. Many systems within Queensland Health do not provide state-wide access to the information they contain. The ability to view information within Queensland Health's systems anywhere in the state (subject to privacy and confidentiality considerations) is a key capability underpinning the eHealth vision.

The AUSLAB pathology system is an example of a system that does provide state-wide access to results, enabling a provider in one location to access results of tests undertaken in a different location.

Queensland Health's State-wide Telehealth Service provides real-time access to a range of services for locations which may lack sufficient resources, particularly specialist resources. The PACS trial in the Northern Zone links smaller towns such as Mt. Isa, Cairns, Mackay to Townsville. The 'hub and spoke' arrangement allows images to be sent from the various locations to Royal Brisbane Hospital for specialist advice. This initiative aims to link smaller hospitals by the end of 2006.

Building on What Is There

State-wide access to diagnostic imaging results may enable a specialist in any remote location around the state to analyse an image, and provide advice to a provider in another location who is currently treating a patient. Care providers in remote locations may require additional information to understand patient history and/or make informed care decisions to assist treatment.

The current ability to view diagnostic imaging results, and other information, only within the boundary of certain facilities and locations can be extended to provide similar state-wide access. The QRiS project aims to provide access to diagnostic images from various locations.

Access restrictions to systems and information based on geography (e.g. mental health systems only provide district-wide access) should be relaxed to enable greater access to patient information. A mental health provider in the Northern district may access patient information captured by another provider in the Central district for example, if appropriate access to relevant systems was granted to approved providers. Such access may support more appropriate patient care, especially when patients are incapable of providing coherent and complete information to providers (e.g. mental health patients, Alzheimer's sufferers, unconscious patients).

Systems which enable location-independent capabilities should be interoperable with systems such as scheduling. Such interoperability may deliver greater value in the form of optimal utilisation of tele-health systems based on patient and provider availability.

7 Recommended approach for implementing the eHealth vision

7.1 Principles for implementation

Consultation with key stakeholders identified a number of principles that were subsequently followed in developing the eHealth Strategy and determining the approach for implementation. The principles highlight issues encountered with previous attempts to execute large IT programs, and encourage the use of existing capabilities that are deemed to be valuable.

The principles for the implementation of the eHealth Strategy are:

- Build on what exists today and re-use viable capabilities in place
- Establish solid functionality and information, and then build new capabilities
- Introduce new and extended capabilities in phases, and realise benefits incrementally
- Identify solutions that improve quality of care and patient outcomes, while easing the workload burden on care providers
- Implement simple and practical solutions that can be refined over time.

These principles have guided development of the eHealth Strategy, and assessment of options to deliver desired capability.

7.2 Recommended Approach

Two options were considered for closing the gap between Queensland Health's current capabilities and those required to deliver the vision of the patient-centric networked model of care. The two options were:

- Approach 1 (or 'Incremental' approach) – in which the required capabilities are delivered incrementally over time, primarily through the implementation of an Enterprise Information Repository to integrate information from various feeder systems
- Approach 2 (or 'Big Bang' approach) – in which the required capabilities are delivered through the implementation of a state-wide Clinical Information System

Both approaches focus on the implementation of the core foundational capabilities required to support the eHealth vision, as well as delivering an architecture that will support the integration of additional speciality systems. The implementation of these speciality systems (such as ICU, Anaesthetics and Oncology) will not be delivered within the scope of the core eHealth program, but will be managed as discrete projects under existing ISIB governance arrangements and coordinated to align with the core eHealth program.

Of the two options considered, the incremental approach was recommended, and subsequently endorsed by the Queensland Health Executive Management Team. This approach addresses one of the key findings to date – that many of the issues the organisation currently faces are due to a lack of access to integrated information. The primary focus within this approach is to draw together information from key source systems early to provide an integrated view of patient information. Enhanced functional capabilities around ordering, scheduling and decision support will be developed in parallel, and delivered over the medium to longer term.

In order to achieve this, the incremental approach decouples information from functionality – separating information required to meet business needs from the applications that process that information. Rather than delivering large and complex applications such as a Clinical Information System to meet the informational needs of stakeholders, these informational needs are met by the integration of existing information sources to an Enterprise Information Repository. In this way, capability can be delivered earlier and more incrementally than a traditional large-scale systems implementation.

This approach involves the implementation of an Enterprise Information Repository to provide integrated patient information for the organisation. Capability is then built incrementally by integrating additional feeder systems and by implementing additional functionality over time. The balance of functionality is delivered upon the implementation of a replacement Patient Administration System and a new Clinical Information System in the medium-to-longer term.

The recommended approach was preferred for the following reasons:

- This approach best supports Queensland Health’s desire for an incremental approach to the eHealth Strategy and supports the implementation principles described in Section 7.1 in the following ways:
 - The approach builds on existing capabilities and relevant projects to leverage information and functionality that already exists to build a solution that combines existing and new capabilities. This is based on the understanding that much of the information that care providers need already exists in Queensland Health systems but is not easily accessible or integrated with other information
 - The approach builds incrementally, providing an increasingly rich repository of consolidated and integrated information to support care delivery while delivering increasingly advanced capabilities over time
 - The approach is based on building solid foundations for information and functionality through a focus on robust systems integration and data consolidation processes that promote data integrity and quality
 - The approach focuses on delivering simple capabilities first to meet high priority needs and then extending these capabilities over time
 - The approach focuses on implementing capabilities that improve care quality and patient outcomes by providing improved information on which to base decision making and treatment planning while at the same time providing tools and information to automate menial tasks allowing care providers to focus on care delivery
- The incremental approach also avoids the need for Queensland Health to commit early to a large scale Clinical Information System implementation project at a time when the product offerings in this application sector are not mature and vendors may be experiencing resource capacity issues.

In addition, the recommended approach provides a highly flexible implementation path that can adapt to changes in Queensland Health's priorities as well as providing the framework for making decisions about technical and architectural directions to ensure the most approach solutions are chosen to meet Queensland Health's needs. As such, this approach embraces the notion of health care as a complex adaptive system, allowing the strategy to evolve and adapt as further evidence emerges and requirements change. Finally, the incremental approach allows Queensland Health to continue to monitor and align with developments in both the national eHealth agenda (including NEHTA) and the Smart Directions statement for ICT investments within the Queensland Government.

Further information regarding the analysis and consideration of both options is attached in Appendix E.

The preferred approach and its associated capability progression formed the basis for the development of the eHealth program of work as outlined in the following section.

8 eHealth Program of work

8.1 Program overview

Implementing the eHealth vision will involve the coordination of a large number of significant and concurrent initiatives. The proposed program of work involves a large number of initiatives being executed over a five year timeframe. An eHealth Program structure will need to be established in order for the program to be effectively managed.

The proposed eHealth Program consists of 21 initiatives grouped into four portfolios. Each portfolio contains a number of related initiatives and will be managed as a sub-program within the broader eHealth Program (*Update comment: May 2007 – a revised portfolio structure is under review*).

8.1.1 Portfolio 1: Information Integration and Communication

The Information Integration and Communication portfolio is focused on providing integrated patient information to care providers within Queensland Health and facilitating the exchange of information between Queensland Health and external providers such as GPs, private providers and NGOs. The core of this portfolio is the project to establish the Enterprise Information Repository and the initiative to integrate clinical information into the repository to support the provision of a consolidated view of patient information.

The Information Integration and Communication portfolio includes the following initiatives:

- Enterprise Information Repository
- Systems Integration
- User Portals
- Information Communication

8.1.2 Portfolio 2: Core Systems Implementation

The Core Systems Implementation portfolio focuses on selecting, developing and implementing core systems that will provide the capabilities described in the eHealth Strategy.

The Core Systems Implementation portfolio includes the following initiatives:

- Medications Reporting
- Emergency Information Management
- Diagnostic Imaging
- Community Health, Mental Health and Chronic Disease Management
- Patient Management and Coordination
- Analysis and Reporting
- Clinical Management (including eOrders and ePrescribing)

8.1.3 Portfolio 3: Foundation Projects

The Foundation Projects portfolio contains projects or initiatives to implement functionality and information management practices that will provide a foundation for the eHealth Strategy. These projects are designed to ensure data consistency and integrity between disparate systems to ensure that data consolidation in the enterprise information repository is meaningful.

Initiatives included within the Foundation Projects portfolio are:

- Information Management (Code-set Interoperability and Standardisation / Policy Issues)
- Unique Patient Identifier
- Unique Provider Identifier and Services Catalogue

8.1.4 Portfolio 4: Managing and Delivering the eHealth Program

The Managing and Delivering the eHealth Program portfolio includes the initiatives that will prepare the organisation and its people for the significant transformation required in delivering the eHealth vision. This initiative is also responsible for establishing the supporting structures, tools and processes to coordinate execution of the program of work.

The initiatives included within the Managing and Delivering the eHealth Program portfolio are:

- Change Leadership
- Business and Clinical Alignment
- Program Communications
- Transition and Sustaining the Change
- Benefits Realisation
- Program Management Office and Architecture
- Quick Wins

The initiatives within the first 3 portfolios combine to deliver the capabilities required in order to achieve the eHealth vision. The following table identifies the extent to which each initiative contributes to the eHealth capabilities defined in Section 5.3.

		eHealth Strategy Capabilities			
		Integrated and comprehensive patient information	Consolidated information to support decision making	Optimising scheduling around patient need	Supporting delivery of location-independent health services
Portfolio 1: Information Integration and Communication	Enterprise Information Repository	✓	✓	✓	✓
	Systems Integration	✓	✓	✓	✓
	User Portals	✓	✓	✓	✓
	Information Communications	✓		✓	✓
Portfolio 2: Core Systems Implementation	Medications Reporting	✓	✓		✓
	Emergency Information Management	✓	✓	✓	✓
	Diagnostic Imaging	✓	✓	✓	✓
	Community Health and Mental Health	✓	✓	✓	✓
	Patient Management and Coordination	✓	✓	✓	✓
	Analysis and Reporting	✓	✓	✓	✓
Portfolio 3: Foundation projects	Clinical Management	✓	✓	✓	✓
	Information Management	✓	✓	✓	✓
	Unique Patient Identifier	✓		✓	✓
	Unique Provider Identifier and Services Catalogue		✓	✓	✓

The following section introduces each of these initiatives and provides an overview of the objectives, scope and key activities for each.²² The majority of the activities within the program (and particularly within the first 4 portfolios) adopt a similar process pattern, summarised by the following high-level steps:

- Determine Strategy – which involves analysing options and developing recommendations regarding the proposed strategy for a given initiative
- Review / Assess – which involves reviewing existing capabilities and determining the extent to which these can be leveraged or used to inform the activities within a given initiative
- Select – which involves defining detailed requirements and selecting an appropriate solution through the relevant procurement process
- Design & Build – which involves designing, building and testing the solution
- Implement – which involves deploying the solution into operational environments and training end-users on the use of the solution

²² Further information regarding the initiatives can be found in Appendix A – Detailed enabling initiative briefs.

8.2 Portfolio 1: Information Integration and Communication

8.2.1 Enterprise Information Repository

Objectives and Scope

The Enterprise Information Repository initiative designs and implements a repository to initially provide integrated patient demographic and pathology results data. As other solutions are implemented during the eHealth program of work, this initiative extends the repository to progressively provide more comprehensive, integrated patient information.

The scope of this initiative includes aggregating relevant data from:

- All solutions which are implemented as part of the eHealth program of work
- The following clinical specialty systems: ICU, emergency, anaesthetics, cardiology/coronary care, oncology, renal
- The following clinical measurement systems: neurology, cardiology, gate, respiratory, gastroenterology.

Key Activities

- Define functional/technical requirements for repository
- Analyse existing platforms for suitability
- Select of new platform (if required)
- Commence detailed design of repository (iterative process)
- Develop and test repository proof of concept
- Implement repository – Patient Demographics and Pathology
- Extend repository – Imaging, Clinical Measurements, Clinical Notes and Community Health / Mental Health
- Implement repository – eReferral and Pre-Admission Information

8.2.2 Systems Integration

Objectives and Scope

This initiative establishes principles, standards and technologies to integrate feeder systems with the Enterprise Information Repository. The initiative designs policy and governance arrangements for the access to/use of the repository.

The following integration points are in scope for this initiative:

- Integration between the feeder systems and the Enterprise Information Repository
- Integration between relevant systems such as Emergency Department and Patient Administration systems

The initiative *does not* include:

- Integration between systems and the Unique Patient Identifier solution²³
- Integration between the User Portal solution and the Enterprise Information Repository²⁴.

Key Activities

- Analyse Systems Integration requirements and define principles/standards
- Define technical requirements for integration platform
- Assess existing integration platforms for suitability
- Select and implement new integration platform (if required)
- Design and model integration components
- Build and test integration Proof-of-Concept
- Implement Stage 1 integration: PAS and AUSLAB
- Implement Stage 2 integration: Diagnostic Imaging, Clinical Measurements and Clinical Speciality Systems
- Implement Stage 3 integration: state-wide PAS, orders and external integration
- Implement Stage 4 integration: CIS

²³ This integration is in scope for the Unique Patient Identifier initiative

²⁴ This integration is in scope for the User Portals initiative

8.2.3 User Portals

Objectives and Scope

The User Portals initiative is responsible for designing and implementing portals to allow Queensland Health staff, external providers and patients to access patient information from the Enterprise Information Repository. The initial focus of this initiative is on the development of a patient information portal for use by care providers within Queensland Health. A portal for external providers and a patient self-care portal are progressively added.

The scope of this initiative *may* include developing portal access to other information solutions (eg. Community and Mental Health) if there is a requirement and benefits can be identified.²⁵

Key Activities

- Define functional/ technical requirements for portals
- Analyse existing platforms for suitability
- Selection of new platform (if required)
- Commence detailed design of portals (iterative process)
- Develop and test portal Proof-of-Concept for Queensland Health care providers
- Implement Stage 1: Queensland Health care provider portal
- Implement Stage 2: external care provider portal
- Implement Stage 3: patient self-care portal

²⁵ For example, if the Community and Mental Health solution is not web-based, providing greater access via the portal may be a feasible option to deliver desired capability

8.2.4 Information Communications

Objectives and Scope

This initiative defines and develops information structures and messages to support communication between care providers (and their systems), both internal and external to Queensland Health.

The following ‘messages’ are in scope for this initiative:

- Discharge summaries
- Clinical hand-offs
- Electronic referrals
- Pre-admission summaries

Key Activities

- Analyse information communication requirements
- Define information communication principles and standards
- Define generic information communication patterns
- Build and test generic information communication model Proof-of-Concept
- Implement Stage 1: Basic Care and Discharge Summary
- Implement Stage 2: Detailed Care and Discharge Summary
- Implement Stage 3: e-Referral / Pre-admission

8.3 Portfolio 2: Core Systems Implementation

8.3.1 Medications Reporting

Objectives and Scope

The Medications Reporting initiative implements a state-wide medications history and reporting capability. To achieve this, the capability that has been developed and implemented to date by the eLMS project will be leveraged.

The scope of this initiative extends to provision of medications reporting capabilities by providers internal and external to Queensland Health who work in acute and non-acute settings.

ePrescribing is not in scope for this initiative, however it is in scope for the Clinical Management initiative.²⁶

Key Activities

- Review requirements and determine whether additional requirements are required
- Review the functionality delivered by the eLMS project and the plan for enhancements
- Select additional software if required
- Design and build eLMS enhancements
- Implement eLMS enhancements

²⁶ Refer to section 8.3.7 for more detail of the Clinical Management initiative

8.3.2 Emergency Information Management

Objectives and Scope

The Emergency Information Management initiative implements a state-wide Emergency Department information management capability across all Queensland Health facilities that provide emergency medicine. This project will leverage capability developed and implemented to date by the EDIS project, and will also address supporting emergency medicine management in facilities not currently in scope for the EDIS project.

The following facilities are in scope for this initiative:

- Approximately 22 major emergency medicine facilities
- Approximately 23 smaller emergency medicine facilities

Key Activities

- Review requirements for the EDIS enterprise solution
- Review / assess EDIS project
- Design and Build common state-wide footprint (major sites)
- Implement state-wide footprint (major sites)
- Determine strategy for smaller emergency departments
- Select new software (if required)
- Design and Build state-wide footprint for smaller emergency departments
- Implement state-wide footprint for smaller emergency departments

8.3.3 Diagnostic Imaging

Objectives and Scope

This initiative will implement a state-wide capability for diagnostic imaging including both a Picture Archiving and Communication System (PACS) and Radiology Information System (RIS).

All diagnostic imaging will be in-scope for this initiative.

Key Activities

- Determine requirements for an integrated PACS/RIS solution
- Review / Assess recent, current and planned projects
- Select new solution (if required)
- Design and Build state-wide PACS/RIS (pilot)
- Implement PACS/RIS pilot
- Design and Build state-wide PACS/RIS (state-wide roll-out)
- Implement state-wide PACS/RIS solution

8.3.4 Community and Mental Health

Objectives and Scope

This initiative determines a strategy²⁷ for delivering integrated case-management capability for community and mental health, and chronic disease management. It then selects, develops and implements a solution(s) for state-wide, integrated case and client management to meet the needs of community health, mental health and chronic disease management.

The solution(s) will provide functionality to support patient self-care, particularly with respect to chronic disease, and provide patient registration functionality in the community sector.

The following are in scope for this initiative:

- Provision of a case-management solution(s) for community and mental health, and chronic disease management to community and primary care providers internal and external to Queensland Health, and to patients to support patient self-management
- Integration with solution(s) delivered by the User Portals initiative where required

Key Activities

- Determine requirements for a state-wide case management solution for Community and Mental Health
- Review / Assess current and planned projects
- Assess options for implementing an integrated Community and Mental Health solution to meet requirements compared with separate solutions for both
- Select solution(s)
- Design and Build Community and Mental Health solution
- Implement Community and Mental Health solution

²⁷ The strategy assesses viable options for delivering integrated case management for each of community health, mental health and chronic disease management. The initiative does not automatically assume that one solution is appropriate for these care sectors.

8.3.5 Patient Management and Coordination

Objectives and Scope

This initiative will develop a strategy to determine the best approach to implement a patient management and coordination solution. The strategy will determine whether a replacement Patient Administration System (PAS) will provide patient coordination (e.g. scheduling and booking) capabilities in addition to patient management capabilities, and how feasible alternative patient coordination solutions are. The initiative will then plan, select and implement:

- A replacement for the HBCIS PAS system with a state-wide solution for patient management
- A patient scheduling and booking solution.

The following are in scope for this initiative:

- Patient management within Queensland Health acute facilities
- Patient coordination for services provided internal and external to Queensland Health
- Integration between the patient coordination and patient management solutions where required.

Key Activities

- Determine patient management and patient coordination (scheduling and booking) requirements
- Consider to what extent a PAS should incorporate scheduling and booking functionality
- Review and assess existing projects and/or applications which may provide insight into required functionality, or lessons learnt regarding implementation of similar functionality
- Select solution(s)
- Design and Build Patient Management Solution(s)
- Implement Patient Management Solution(s)

8.3.6 Analysis and Reporting

Objectives and Scope

The Analysis and Reporting initiative will implement a ‘special-purpose’ data warehouse based on information contained within the Enterprise Information Repository. The initiative will enable data analysis and reporting capabilities to support:

- Management and performance reporting
- Clinical practice improvement
- Public health research

The scope of this initiative extends to analysis of, and reporting on, data contained in the Enterprise Information Repository which includes all solutions which are implemented as part of the eHealth program of work, clinical specialty systems (ICU, emergency, anaesthetics, cardiology/coronary care, oncology, renal systems), and clinical measurement systems (neurology, cardiology, gate, respiratory, respiratory, gastroenterology systems).

Key Activities

- Determine requirements and scope for basic aggregate patient reporting of patient management and pathology data
- Select new solution (if required)
- Design and Build Analysis and Reporting Solution – Basic aggregate patient reporting
- Implement Basic aggregate patient reporting
- Design and build solution extensions to accommodate diagnostic imaging, clinical measurement and clinical specialty data
- Implemented extended aggregate patient reporting
- Design and build solution extensions to provide capacity and availability reporting
- Implement capacity and availability reporting

8.3.7 Clinical Management

Objectives and Scope

The Clinical Management initiative will develop a strategy to determine the best approach to deliver clinical management capabilities including eOrdering and ePrescribing. The strategy will identify whether capabilities are best delivered with an integrated Clinical Information System (CIS) solution or individual ordering, prescribing, and clinical management solutions. The initiative will then select, design and implement the capabilities required to support electronic ordering of tests for pathology, diagnostic imaging and clinical measurement, as well as implementing electronic prescribing and other clinical management capabilities.

The scope of this initiative extends to acute and non-acute facilities internal and external to Queensland Health.

Key Activities

- Determine Clinical Management requirements and develop Clinical Management Strategy and options assessment
- Select solution(s) for Clinical Management capabilities (either integrated CIS, eOrders and ePrescribing – or separate solutions)
- Design and Build CIS, eOrders and ePrescribing solution(s)
- Implement CIS, eOrders and ePrescribing solution(s)

8.4 Portfolio 3: Foundation Projects

8.4.1 Information Management

Objectives and Scope

The Information Management initiative focuses on the standardisation of code-sets across core clinical applications and domains, as well as identifying and resolving policy issues (such as privacy and consent).

Standardising code-sets and establishing code-set management for clinical domains will allow consistent representation and interpretation of information across applications. A key part of this project is working with stakeholder groups to agree on common code-sets, and encourage the use of standards. Code-set standardisation for the following applications is in scope for this initiative:

- Patient Administration Systems (PAS)
- Pathology (AUSLAB)
- Diagnostic imaging
- Clinical measurement (neurology, cardiology, gate, respiratory, respiratory, gastroenterology), and clinical specialty (ICU, emergency, anaesthetics, cardiology/coronary care, oncology, renal systems) systems
- Patient workflow and decision support²⁸

The information management initiative will also identify and resolve relevant policy issues such as privacy and consent in order to support the enablement of the eHealth capabilities. In doing so, this initiative will need to be cognisant of the work undertaken by NEHTA and will need to liaise with numerous stakeholders within and external to Queensland Health. The outcomes of this process will be clear and consistent direction and policy regarding how privacy, consent and related issues will be addressed and accommodated within the eHealth program of work. This may include recommendations regarding current policy and legislative frameworks.

Key Activities

For each code-set group:

- Determine whether any standard code-sets are currently being used
- Identify requirements that a standard code-set must satisfy
- Assess standard code-set viability
- Select a code-set
- Design code-set implementation and management
- Implement code-set

For policy issues:

- Identification and resolution of relevant policy issues (ongoing process)

²⁸ Patient workflow capabilities will be implemented during the Patient Management and Coordination initiative; decision support will be implemented during the Clinical Management initiative.

8.4.2 Unique Patient Identifier

Objectives and Scope

The Unique Patient Identifier initiative will initially focus on consolidating patient identifiers, leveraging work done by the Client Directory project. Progress will then be made towards adoption of a *single* unique identifier. This initiative includes the development of a strategy to determine whether the best approach to implementing a single unique identifier is through use of a Patient Administration System Master Patient Index (MPI), or continued use of the Client Directory solution.

The following are in scope for this initiative:

- Patients internal and external to Queensland Health who are being treated (or have received treatment) in acute, primary and community care settings
- All solutions (e.g. diagnostic imaging, emergency information management) implemented via initiatives in the eHealth program of work
- Integration between the above solutions, and AUSLAB, and the Unique Provider Identifier solution

Key Activities

- Determine requirements and scope for patient identifier consolidation across core eHealth systems
- Review / Assess Client Directory project
- Design and Build consolidated patient identifier (incl. non-acute)
- Implement consolidated patient identifier (incl. non-acute)
- Design, Build and Implement extensions as additional systems are integrated
- Determine strategy for Unique Patient Identifier in conjunction with Patient Management and Coordination initiative and NEHTA Individual Healthcare Identifier
- Design and Build Unique Patient Identifier solution
- Implement Unique Patient Identifier solution

8.4.3 Unique Provider Identifier and Services Catalogue

Objectives and Scope

This initiative will establish a state-wide Services Catalogue to support state-wide ordering, booking and capacity reporting capabilities. The initiative will also develop a unique provider identifier to facilitate identification of, and communication with, providers internal and external to Queensland Health via the Services Catalogue.

The following are in scope for this initiative:

- Services internal and external to Queensland Health delivered in the acute, primary and community care settings
- Individual and facility-based providers internal and external to Queensland Health

Key Activities

- Determine requirements and scope for provider identifiers
- Review / Assess existing Provider Directory project
- Select new/additional software if required
- Design and Build Unique Provider Identifier solution
- Implement Unique Provider Identifier solution
- Design and Build Services Catalogue
- Implement Services Catalogue

8.5 Portfolio 4: Managing and Delivering the Program

8.5.1 Change Leadership

Objectives and Scope

The purpose of the Change Leadership initiative is to ensure that senior leadership are actively engaged and are supportive of the eHealth Program and that the change is owned and driven by those identified senior leaders. The objectives of the Change Leadership initiative include:

- Ensuring the appropriate stakeholders are actively engaged in the eHealth Program including project purpose, aims and objectives;
- Enabling leadership to develop a strong understanding of project impacts and effects on their staff and customers, and the role they will be required to play in the change;
- Encouraging ownership, commitment and sponsorship for project risks, outcomes and deliverables;
- Providing forums for leadership to provide and receive feedback and engage in two way communication with impacted stakeholders; and
- Managing leadership expectations and reducing negative or speculative information by providing timely and accurate project information.

Key Activities

- Undertake senior stakeholder analysis
- Obtain common understanding and commitment to future state
- Assign individual accountabilities
- Implement leadership alignment strategies
- Monitor and track leadership engagement and alignment

8.5.2 Business and Clinical Alignment

Objectives and Scope

The Business and Clinical Alignment initiative focuses on the strategies and activities required to address the significant process and clinical practice issues, including analysing and redesigning the configuration of work to achieve the clinical and business practice change that will be required for successful adoption and use of the new capabilities implemented by the eHealth strategy.

This initiative is comprised of three main components:

- Business process and job redesign
- Capability development
- Performance management.

Key Activities

- Current state assessment
- Business process and job redesign
- Organisational impact assessment
- Transition planning
- Capability development
- Transition support
- Performance management

8.5.3 Communications

Objectives and Scope

The purpose of the Communications initiative is to create awareness and build commitment to the vision, objectives, plans, and expected results of the eHealth Program amongst key stakeholders. The overall objective of the Communications initiative is to ensure that the right people deliver the right messages to the right audience at the right time using the most appropriate communication(s) channel.

This initiative will focus on the communications and stakeholder engagement activities that are required in conjunction with the transformation initiative, working with clinical networks and collaboratives, area and district management and other groups to ensure that people are informed and aware of the eHealth Strategy and work program.

Key Activities

- Establish communication objectives
- Identify and analyse stakeholders
- Define communication channels
- Develop Communication Plan
- Develop and deliver communications
- Collect feedback
- Refine communications

8.5.4 Business Transition and Sustaining the Change

Objectives and Scope

This initiative will focus on delivering effective end-user learning and ensuring that the eHealth initiatives are adequately resourced and successfully embedded within the day to day operations of the business. The scope of this initiative may also include:

- Program planning and resourcing
- Knowledge sharing
- Customer and supplier engagement
- Coaching and mentoring.

Key Activities

- Develop end-user learning strategy
- Determine initiative learning requirements
- Develop learning standards, platforms and tools
- Develop learning program and materials
- Conduct learning needs analysis
- Deliver end-user learning program
- Evaluate and continuously improve end-user learning services

8.5.5 Benefits Realisation

Objectives and Scope

The purpose of the Benefits Realisation initiative is to identify and track business benefits for each of the initiatives and the eHealth Program as a whole. Integral to this initiative is the confirmation of business benefit owners and the development of a performance culture.

The initiative is supported by robust business cases for each of the initiatives and the development of an effective benefits tracking and reporting framework for the eHealth Program as a whole. The business cases and benefit realisation plans are refined as the program progresses. The Benefits realisation initiative may transition to a Continuous Improvement Team on completion of the Program.

Behaviour alignment is key to realising the benefits expected from process improvement and technology.

Key Activities

- Define eHealth value targets and success factors
- Confirm initiative benefits, measures and benefit owners
- Develop business cases and benefits realisation plans
- Develop benefits tracking processes and tools
- Stakeholder education and engagement
- Track and report on benefits and lessons learned
- Realise benefits and continuously improve

8.5.6 PMO and Architecture

Objectives and Scope

The objective of this initiative is to establish the Program Management Office for the eHealth Program. The Program Office will be responsible for coordinating the delivery of the eHealth Program, including the development and management of the eHealth Program Architecture.

The PMO is not responsible for the delivery of individual projects within the eHealth Program. These will remain the responsibility of the individual project teams and their respective project sponsors.

The PMO will act as a coordination point between projects within the eHealth Program and between the eHealth Program and other key groups within Information Division such as the Delivery Office, Investment Office and Architecture Office.

Key Activities

- Define PMO role and plan PMO implementation
- Plan and execute program logistics
- Establish program policies
- Establish PMO processes
- Develop program architecture
- Manage program / manage architecture

8.5.7 Quick Wins – Infrastructure Access, Education and Training

During the stakeholder consultation process, and the inaugural eHealth Advisory Group workshop, a number of opportunities were identified to improve the use of existing information technology assets. Addressing these opportunities has the potential to bolster the success of the eHealth Strategy, and its credibility. Opportunities relate to increasing the availability of IT infrastructure and promoting a knowledge sharing culture within Queensland Health. Taking advantage of such opportunities could immediately increase the use of information sources and services currently available.

Significant opportunities identified during the consultation process included:

- **Access to PCs and other Access Devices** – many stakeholders expressed a desire for greater access to PCs and other devices in general ward and clinical treatment areas. Section 2.2.9 of the Forster Report cites ‘inadequate access to information technology infrastructure’ as an issue raised by staff²⁹. In providing more PCs, staff may access information and services needed to undertake day-to-day duties in a more timely manner. Increasing access to PCs, and other access devices, will complement the eHealth Strategy by reducing barriers to usage of information and services enabled by the strategy recommendations.
- **Education and Training** – stakeholders also identified the need to increase staff understanding of what information and services are available to Queensland Health staff today, particularly new staff. The Forster Report estimates that half of the clinical workforce is ‘in need of some level of basic computer training’³⁰. Training and education initiatives would allow senior clinical staff and new starters to increase their awareness of information and services that are routinely available. Greater information can ensure staff are familiar with information sources which may support their work. Provision of an ongoing education and awareness program can keep users up-to-date with new information and information technology initiatives.

These and other similar opportunities identified during the customer satisfaction survey work, undertaken by Information Division, have the potential to influence the eHealth Strategy’s success. Adequate infrastructure and an active knowledge sharing culture can alleviate day-to-day workplace frustrations by providing easier access to necessary information. Delivering quick wins with these ‘low-hanging fruit’ addresses real business issues today, and supports the adoption of eHealth initiatives.

Objectives and Scope

The objective of this initiative is to identify and implement initiatives to achieve quick wins in support of the eHealth Program. The early and sustained achievement of quick wins is essential in building credibility for the program, increasing employee engagement and change readiness, and ensuring that barriers to adoption are reduced.

The initial focus of this initiative will be on enhancing access infrastructure (access to PCs and supporting network capacity) as well undertaking education initiatives to raise the level of awareness and proficiency in the use of existing Queensland Health eHealth and information sharing capabilities.

²⁹ P. Forster, *Queensland Health Systems Review: Final Report*, 2005, The Consultancy Bureau, p.30.

³⁰ P. Forster, *Queensland Health Systems Review: Final Report*, 2005, The Consultancy Bureau, p.315.

Program Dependencies

The large number of concurrent and inter-related initiatives within the eHealth Program means that there are also a large number of key dependencies to be managed. Failure to do so may result in delays to the program of work, as well as impacting the ability to realise benefits.

The complexity of the program’s dependencies will also play a key role in the prioritisation and sequencing of program activities, and any proposed revisions to the program scope. Delaying or cancelling the implementation of some initiatives within the program may have significant impacts on other initiatives.

The following matrix summarises some of the key dependencies within the eHealth program to inform discussions around scope, prioritisation and sequencing.

		Delivering initiative (initiative that is depended on)														
		Portfolio 1: Information Integration and Communication				Portfolio 2: Core Systems Implementation						Portfolio 3: Foundation projects				
		Enterprise Data Repository	Systems Integration	User Portals	Information Communications	Medications Reporting	Emergency Information Management	Diagnostic Imaging	Community Health and Mental Health	Patient Management and Coordination	Analysis and Reporting	Clinical Management	Information Management	Unique Patient Identifier	Unique Provider Identifier and Services Catalogue	
Dependent initiative (initiative that relies upon delivery)	Portfolio 1: Information Integration and Communication	Enterprise Data Repository														
		Systems Integration														
		User Portals	●				●	●	●	●	●		●		●	●
		Information Communications	●				●	●	●	●	●		●		●	●
	Portfolio 2: Core Systems Implementation	Medications Reporting		●												
		Emergency Information Management		●												
		Diagnostic Imaging		●												
		Community Health and Mental Health		●	●											
		Patient Management and Coordination	●	●	●											
	Portfolio 3: Foundation projects	Analysis and Reporting	●	●												
		Clinical Management		●												
		Information Management														
		Unique Patient Identifier														
		Unique Provider Identifier and Services Catalogue	●		●											

	Confirmed	Tentative
Hard Dependency	●	●
Soft Dependency	●	●

Further detail regarding the dependencies between program initiatives can be found in the relevant Enabling Initiative Briefs.

8.6 Program Risks

The eHealth program will be a complex undertaking and will require active risk management to ensure that the target outcomes are delivered. The following section explores a number of key risks that have been identified during the development of the eHealth strategy. It is recognised that a more comprehensive assessment of program risks will need to be undertaken as part of the program mobilisation activities.

In assessing the risks to the eHealth program, the following scales have been used.

Likelihood

- 1 Rare - Risk will occur in exceptional (0 – 10%) circumstances.
- 2 Unlikely - Risk is not likely (11 – 25%) to occur.
- 3 Moderate - Risk has a reasonable likelihood (26 – 50%) of occurring.
- 4 Likely - Risk has high likelihood (51 – 75%) of occurring.
- 5 Almost Certain - Risk has a high likelihood (76 – 100%) of occurring even if mitigation is undertaken

Impact

- 1 Insignificant impact during the life cycle of the project. The consequences are dealt with by routine operations. Risks will have almost no impact if realised.
- 2 Minor impact to the project. The consequences would threaten the efficiency or effectiveness of some aspects of the project. Management intervention is likely.
- 3 Average/Moderate impact on the project. The consequences would not threaten the implementation of the project but would mean that the scope would be subject to significant review and possible amendment. Senior Management intervention is required.
- 4 Major impact on the project. The consequences would threaten the implementation of the project and would require management intervention at the highest level.
- 5 Extreme impact on the project. The consequences may halt the implementation of the project.

The overall risk rating for a given risk is determined from the following scale.

Likelihood	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
		Impact				

	Very High
	High
	Medium
	Low

The following key risks have been identified for the eHealth Program.

Risk:	Inability to secure sufficient funding to invest in eHealth and associated change activities.
Consequence:	The eHealth vision will not be achieved and required capabilities will not be delivered to clinicians. This will impact targeted benefits including safety, quality, effectiveness, patient outcomes and efficiency.
Likelihood:	4 - Likely
Impact:	5 – Extreme
Overall Risk:	Very High
Proposed Mitigation Strategy:	<ul style="list-style-type: none"> • Build a strong business case illustrating benefits • Sourcing strategy to raise confidence in ability to execute • Structure program to maximise success (program management, governance, change and stakeholder management)

Risk:	Inability to meet expectations - both internal and external (including community, GPs / external providers, industry/vendors, politicians)
Consequence:	eHealth program seen as failing, even if it delivers in accordance with objectives and scope
Likelihood:	3 – Moderate
Impact:	4 – Major
Overall Risk:	Very High
Proposed Mitigation Strategy:	<ul style="list-style-type: none"> • Understand stakeholder expectations • Manage expectations through active stakeholder engagement, management and communications

Risk:	Capacity of Queensland Health to deliver a program of the complexity of the eHealth Program
Consequence:	Inability to source resources with the appropriate skills and experience to undertake the eHealth program may result in delaying or even stopping the program. Securing sub-optimal resources may impact the quality of outcomes delivered. Shortage of appropriate resources within the market may also impact costs. In addition, the inability to secure appropriate resources may further impact perceptions of the credibility of Information Division.
Likelihood:	5 – Almost certain
Impact:	5 – Extreme
Overall Risk:	Very High
Proposed Mitigation Strategy:	<ul style="list-style-type: none"> • Implementation of a comprehensive sourcing strategy to address both the types of resources required and the strategies for securing supply

Risk:	Solutions designed (both technology and processes) are not relevant to clinicians and do not add value to their roles/clinical practice
Consequence:	Inappropriate solutions will lead to a lack of clinician buy-in and engagement with the program, reduced adoption of solutions and target benefits not being achieved.
Likelihood:	4 – Likely
Impact:	4 – Major
Overall Risk:	Very High
Proposed Mitigation Strategy:	<ul style="list-style-type: none"> • Clinicians actively engaged in design of solutions / work-practices that add value to their roles • Ensure that representative groups are engaged in these processes • Governance processes to ensure strong business sponsorship and engagement

Risk:	Inability of organisation to absorb change (magnitude / rate)
Consequence:	Organisation is unable to commit sufficient business resources to the program, impacting quality, clinical relevance and buy-in. Alternatively, extensive participation in program activities by business representatives results in impacts on health service delivery. Stakeholders may ignore and resist change, reverting to current business practices.
Likelihood:	4 – Likely
Impact:	4 – Major
Overall Risk:	Very High
Proposed Mitigation Strategy:	<ul style="list-style-type: none"> • Adoption of incremental approach to reduce magnitude of change impact • Governance model, business sponsorship and program level change initiatives to monitor and manage change readiness and delivery impacts

Risk:	Not delivering early enough or fast enough
Consequence:	Failure to secure stakeholder engagement and buy-in. Impacts perceptions about Information Division credibility and ability to execute. Costly ad-hoc / interim solutions continue to be developed. Delay in achieving benefits.
Likelihood:	4 – Likely
Impact:	3 – Moderate
Overall Risk:	High
Proposed Mitigation Strategy:	<ul style="list-style-type: none"> • Manage stakeholder expectations • Adoption of incremental approach to deliver capability earlier than “Big Bang” approach • Implementation of Quick Wins initiative to deliver tangible benefits early • Structure and resource deployment activities to meet demand

Risk:	Perceptions of Information Division credibility / reputation
Consequence:	Impacts stakeholder confidence in Information Division’s ability to deliver the eHealth program. May lead to failure of stakeholders to commit to the program and continuing to develop their own capabilities in areas within the eHealth program scope. May also impact the ability to secure funding and/or resources.
Likelihood:	5 – Almost certain
Impact:	4 – Major
Overall Risk:	Very High
Proposed Mitigation Strategy:	<ul style="list-style-type: none"> • Implementation of a comprehensive sourcing strategy to address both the types of resources required and the strategies for securing supply • Adoption of incremental approach to deliver tangible benefits early • Active engagement and management of stakeholders

9 Sourcing strategy

9.1 Sourcing Strategy overview

The program of work associated with implementing the eHealth vision will require access to a pool of highly skilled resources across a range of competency domains to ensure successful delivery. The proposed program of work is based on an accelerated delivery timeframe that focuses on delivering high priority eHealth capabilities as early as possible. The program of work is aiming to establish and utilise repeatable rollout processes to better manage the change and minimise the business impact associated with the rollout of new capabilities to ensure successful delivery. These factors, together with the extensive nature of the work program, will combine to create a high demand for resources that in many cases are already in short supply within Queensland Health.

In some of the required skill domains Queensland Health has existing, in-house resources but not to the level that will be required by the eHealth work program, in other domains, QH has no existing resource base on which to draw. Additionally, in some skill domains, resources will only be required for the duration or part of the program of work, in other domains Queensland Health will require access to skilled resources on an ongoing basis to support the capabilities established by the eHealth program of work.

The lack of access to sufficient capacity suitably skilled resources poses a major risk for the eHealth program of work as it will seriously impact Queensland Health's ability to implement the eHealth vision and realise the associated benefits. To address this risk, there are a range of sourcing models available to Queensland Health that can provide access to the types of resources that will be required. These models include:

- **Insourcing** – building up additional internal capacity and capability through the recruitment, retention and re-training of staff either on contract or permanent basis
- **Out-sourcing** – contracting external service providers to take responsibility for the provision of skilled resources or delivery of discrete components of the eHealth program of work
- **Co-sourcing** – partnering with service providers to form joint teams of resources with a view to building internal capability and expertise through knowledge transfer.

Each of these models have their associated strengths and weaknesses and each are potentially applicable to addressing part of the resource demand required to deliver the eHealth program of work, however no single model is best suited to meeting all resource requirements. Queensland Health will therefore need to adopt a combination of sourcing models in different skill domains to provide access to full resource capacity required.

To help determine the most appropriate combination of sourcing models to use, the sourcing strategy has been formulated. The sourcing strategy considers a range of factors in recommending the most appropriate model for sourcing resources in different skill domains to support the eHealth program of work. Factors considered by the sourcing strategy include:

- Strategic importance of the skill to Queensland Health
- Where the skills exist most strongly in the market
- The degree to which Queensland Health will require the skill on an ongoing basis beyond the duration of the eHealth program of work.

In developing the sourcing strategy, the immediate focus has been on meeting the resource demand of the eHealth program of work, however, the sourcing strategy also provides a sourcing framework that can be more broadly applied to meet resourcing demands for other projects and programs within Queensland Health.

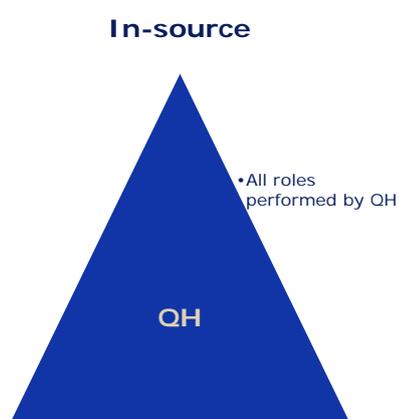
The following sections describe the approach and key considerations associated with the development of a sourcing strategy Queensland Health.

9.2 Sourcing models

There is a range of sourcing models available to Queensland Health that can provide access to the types of resources that will be required. As mentioned in Section 9.1 above, these models include in-sourcing, co-sourcing and out-sourcing.

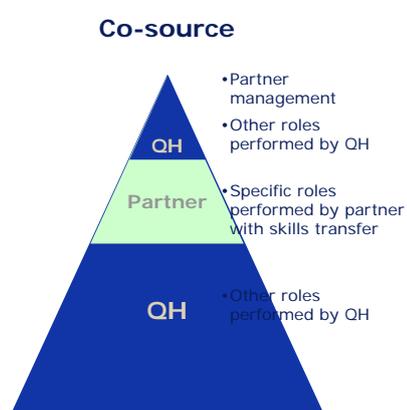
These models can be applied at an overall sourcing strategy level, i.e. Queensland Health can base its overall sourcing strategy on one of these models or, these models can be applied at an individual skill domain level based on the organisation's preferred approach to sourcing different skill domains. The latter approach results in a hybrid model in which two or more of the models are used concurrently.

The following diagrams show how a representative subset of roles may be sourced through each of the different sourcing models:



In adopting the in-sourced model Queensland Health assumes the responsibility and risk for sourcing the required capacity and capability by either recruiting additional resources with the required skills or engaging contractors.

This model is best suited for roles where Queensland Health has an existing, mature capability that it needs to increase the capacity for or where it wishes to build internal capability and there is not an immediate need for a high capacity of resource.

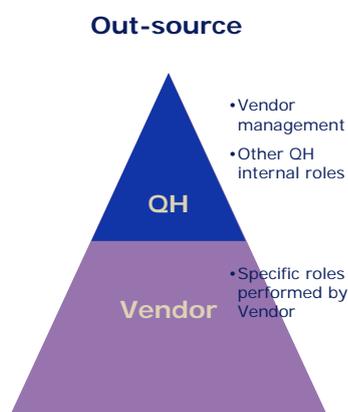


The co-sourced model is based on Queensland Health sharing the responsibility and risk for sourcing the required capacity and capability with a service provider partner. The partner is contracted to provide resources in particular skill domains to supplement existing Queensland Health resources and/or to help establish a skill base through recruitment support and on-the-job knowledge transfer.

This model is best suited for roles where Queensland Health has an immediate need for the capability, doesn't have an existing, mature capability or capacity but wishes to build an internal capability over time.

This model does require that Queensland Health has the management skills in-house to manage the partner to ensure their performance and delivery of required outcomes. It does

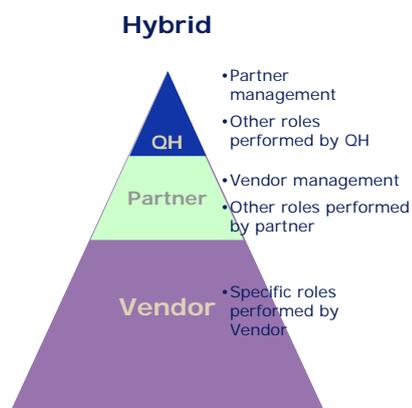
also require that Queensland Health executes a strategy to recruit/build an internal team that knowledge can be transferred to over time.



Where an out-sourced model is adopted, Queensland Health contracts a vendor or service provider to assume the responsibility and risk for sourcing the required capacity and capability. The out-sourcing partner is contracted to provide resources in particular skill domains and/or to take delivery responsibility of an entire component or capability within the program of work.

This model is best suited for roles where Queensland Health has an immediate need for the capability, doesn't have an existing, mature capability or capacity and doesn't wish to build an internal capability over time.

This model does require that Queensland Health has the vendor management skills in-house to manage one or more vendor organisations to ensure their performance and delivery of required outcomes.



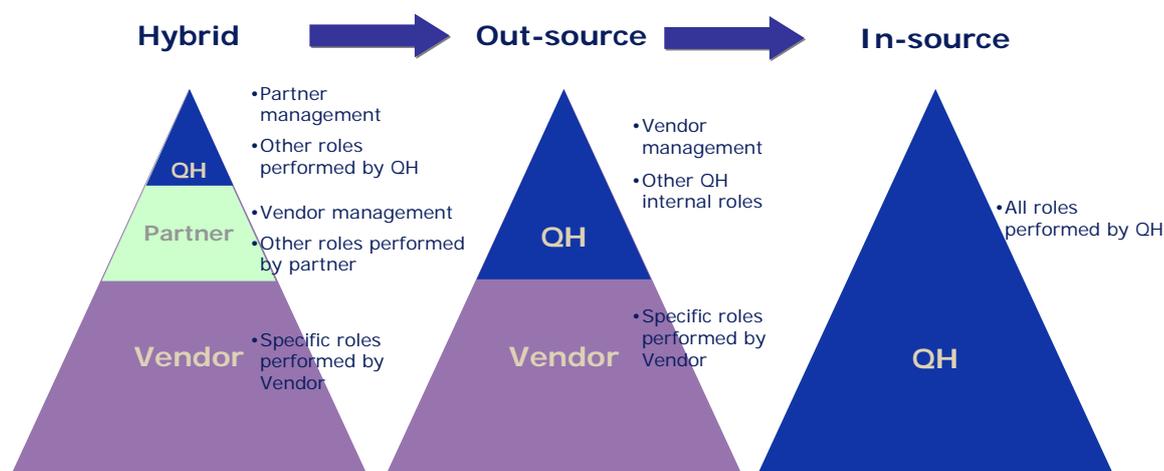
The hybrid model is the most common as it provides an organisation with the flexibility to adopt different sourcing approaches to different skill domains based on organisational preference.

The hybrid model is based on Queensland Health utilising the range of sourcing models to source different capabilities. A partner is contracted to supplement existing Queensland Health resources and/or to help establish a skill base through recruitment support and on-the-job knowledge transfer. Out-sourcing partners are utilised to take delivery responsibility of an entire component or capability within the program of work

Often with this model, the partner organisation is contracted to undertake management and potentially, recruitment of the vendor organisations that provide the outsourced services, meaning that Queensland Health only has to manage the partner organisation.

This model does require that Queensland Health has the management skills in-house to manage the partner to ensure their performance and delivery of required outcomes.

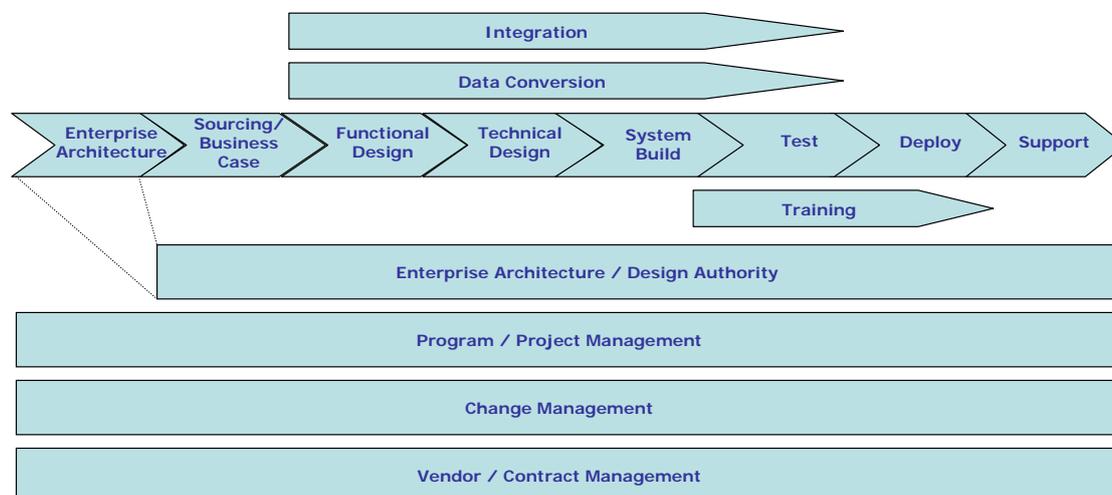
The hybrid model also typically forms the starting point in an approach designed to build long-term internal capabilities for capabilities an organisation wishes to retain in-house while at the same time moving towards out-sourcing arrangements for non-core capabilities. This allows the organisation to move along a sourcing maturity curve from a hybrid arrangement, through an out-sourced model to potentially fully in-source capabilities as capability is built internally. This maturity journey is shown in the following diagram:



For the eHealth program of work, the primary focus of the sourcing strategy is to determine the model or models that will be utilised to source the range of capabilities and resource capacity that is required to deliver the program of work.

9.3 Skill requirements

One of the key inputs to the sourcing strategy is the different skill domains within which resources are required for the program. The different skill domains can best be identified by considering a typical program lifecycle as shown in the following diagram:



The lifecycle diagram shows the typical initiatives and stages associated with a large program of work such as the implementation of the eHealth vision. The initiatives and stages within the lifecycle diagram represent the broad skill domains that are required to deliver a complex program of work. From the lifecycle diagram, the following skill domains can be identified:

Skill Domain	Roles
Enterprise Architecture / Design Authority	The roles required to develop the Enterprise Architecture for Queensland Health in terms of application, information and integration architecture and to provide ongoing design guidance and review to the program of work.
Sourcing / Business Case	The roles required to identify and source appropriate solutions for the capabilities being delivered by the program of work and to develop appropriate business cases for these solutions.

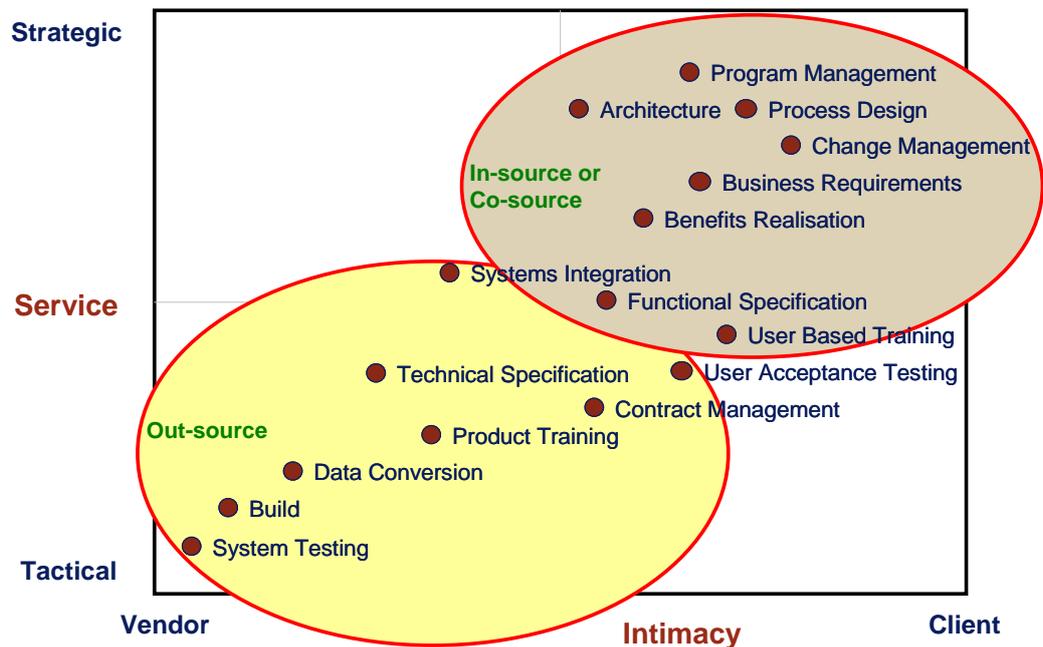
Functional Design	The roles required to undertake functional design of solutions being delivered by the program of work. The functional design domain covers the skills required to develop business requirements, undertake process design and develop a solution architecture.
Technical Design	The roles required to identify technical requirements, develop system designs and solution architecture.
System Build	The roles required to undertake development of systems solutions. This domain covers the roles for building bespoke solutions as well as the package configuration skills required when working with package solutions.
Testing	The roles required to conduct comprehensive testing of solutions prior to implementation. This domain covers the full spectrum of testing types including: unit and system testing, integration testing, user-acceptance testing and stress/performance testing.
Deployment	The roles required to deploy a solution to the user community and transition its maintenance and support from the project team to the production support team.
Support	The roles required to support the ongoing operation of the application including 1 st , 2 nd , 3 rd and 4 th level support as well as infrastructure support.
Integration	The roles required to design, develop and implement the integration capabilities required by the program of work. Roles include: integration analysis/architecture, technical design, build and testing.
Data Conversion	The roles required to migrate data from a legacy application environment to a new solution. Roles include data analysis and mapping, data conversion tool development and data conversion testing.
Training	The roles required to design, develop and deliver training associated with new solutions and/or new processes being implemented. Training roles include: business process training and systems training.
Program / Project Management	The roles required to successfully manage programs and projects to ensure delivery of business solutions. Roles include: program office management, project management and finance and benefits tracking.
Change Management	The roles required to successfully manage the business change associated with the implementation of new business solutions and process changes. Roles include: user impact assessment, communication and business process redesign.
Vendor / Contract Management	The roles required to successfully negotiate and manage contracts with vendors to deliver products or services. Roles include: vendor performance management, partnership management, contract negotiation and contract administration.

The sourcing strategy for Queensland Health is focused on providing a means for sourcing suitably skilled resources to undertake these roles.

9.4 Sourcing framework

To determine the most appropriate combination of sourcing models to use, a range of factors such as the importance of the skill to Queensland Health, the degree to which skills exist in the market and the degree to which the skills will be required on an ongoing basis must be considered. The strategic importance of the skill to Queensland Health is a critical factor as strategically important skills are typically those that are considered core to the organisation or are required to manage roles that will have a high impact on end users of the capabilities delivered. Typically such skills are retained in-house or closely managed through co-sourcing arrangements.

The following figure shows how different roles are typically graded in terms of strategic importance:



While strategic importance is a key consideration, there are a number of other key factors that need to be considered when determining whether to in-source, co-source or out-source. These factors form the basis of the sourcing framework that is the vehicle used to determine the Queensland Health sourcing strategy. These factors are:

- **Strategic Importance** – To what extent does this capability *directly impact*:
 - customer relationships
 - healthcare outcomes
- **In-sourcing** – To what extent does Queensland Health *need* to have in-house resources performing this capability in the medium term (1 - 2 years)
- **Current State** – How well is Queensland Health able to provide this capability given:
 - the current maturity level / demonstrated track record
 - the capacity to resource this capability to the levels required
- **Ability to staff** – To what extent can Queensland Health:
 - recruit staff (i.e. find staff in the market with the required skills)
 - retain staff to support this capability
- **Vendor Capability** – How well can the external vendor community support this capability from a breadth and depth of skills perspective, ignoring capacity.

Consideration of these factors for each of the required capabilities will allow Queensland Health to determine the preferred sourcing model to be adopted. The various factors that influence the particular sourcing model to be adopted for the different skill domains form the basis of a sourcing framework that can be analysed to identify the preferred sourcing model or models. The development of a sourcing framework for Queensland Health and the associated analysis and recommendations are discussed in Addendum 1 to the eHealth Strategy.

10 Program governance

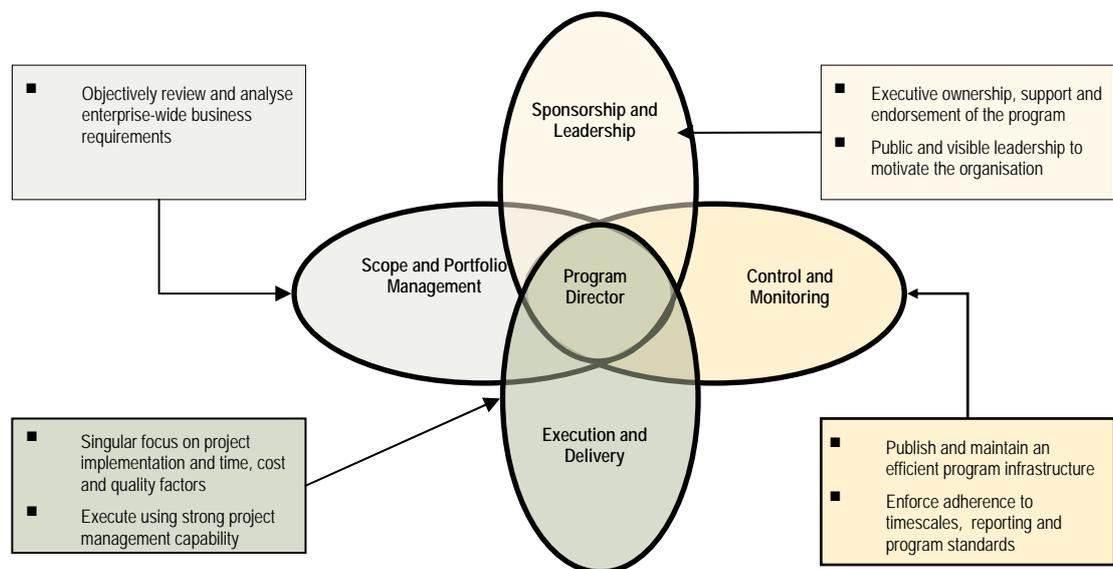
Effective program governance will be critical to the success of the eHealth program. As previously detailed, the proposed program of work represents an extremely complex undertaking with a large number of major initiatives being executed concurrently. The scope of the program has a broad functional footprint, and the program will deliver capabilities that will have significant impact on many different areas of the organisation – predominantly those directly focussed on service delivery. In addition, the proposed program of work represents a major investment of capital funds requiring careful oversight to ensure that benefits are realised, and that adequate controls are implemented and enforced.

This section does not recommend a definitive governance structure for the eHealth program, but provides some recommendations and guidelines that should be considered during the program establishment phase.

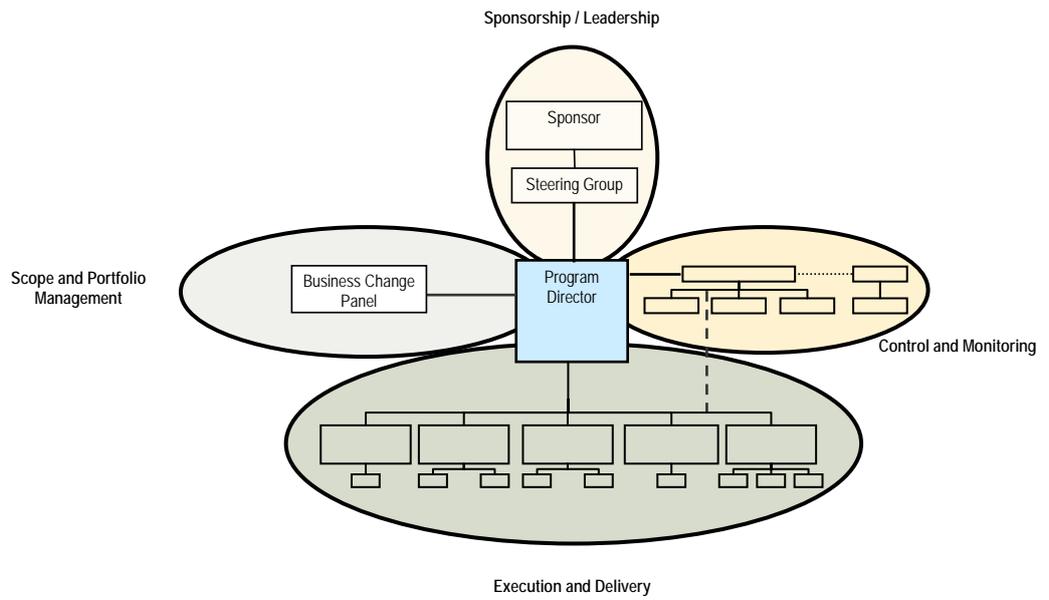
An appropriate governance model will ensure that:

- Decision making is executed at the appropriate level and made with appropriate knowledge
- Decision making is timely and effective and does not disrupt program progress
- Benefits are delivered to the business
- A strong link between the program and the organisation is maintained, so that changes within the organisation are reflected within the solutions developed by the program
- Corporate controls are maintained
- Organisational wide synergies are realised
- Common processes are promoted across the organisation wherever appropriate
- Appropriately skilled resources are deployed
- All relevant stakeholders are effectively managed
- The competing needs of the organisation, individual business units and geographies are managed.

In determining the most appropriate governance model for the program, Queensland Health should ensure that the following dimensions are incorporated.



The following high-level structure provides an example of how the various bodies of the governance model for a large-scale program represent these dimensions.



In this way, organisational leaders and business sponsors can play a critical role in leading the program, whilst ensuring that appropriate guidance and due diligence is provided by senior business level representatives with relevant business, functional and technical exposure.

11 Next steps

The eHealth strategy and roadmap described in this deliverable brings this initial phase of work to completion. Significant progress has been made in engaging stakeholders as evidenced by the constructive input received from the eHealth Advisory Group as well as by the broadly positive feedback received via the intranet site where staff across Qld Health were invited to comment on the highlights of the strategy. The momentum gained through this phase indicates that people who have been exposed to the strategy are embracing the vision for eHealth.

Before the program of work can be established, there is a need to obtain endorsement and appropriate levels of funding. A period of time is likely to elapse between the end of this phase and the start of the eHealth program. A period of inactivity in the time between the end of this phase and the start of the program could break the momentum that has been gained and any opportunity to complete the necessary pre-work would be lost.

There are a number of prerequisites that should be completed prior to embarking on delivering the eHealth agenda. Additionally there are a number of activities that if fast tracked, could significantly improve the establishment of the program. These activities are critical to maintain the momentum created in the current phase, whilst appropriately establishing a foundation for the broader eHealth program. A number of initiatives have been identified. They can be categorised as follows:

- Design and operationalise the governance model
- Develop the business case
- Develop the enterprise architecture
- Assess information repository trends
- Kick-off feasibility assessments

Each is covered in subsequent pages of this section of the deliverable. Once endorsed as a necessary pre-requisite to establishing the program, detailed plans need to be completed for each initiative.

11.1 Design and operationalise the governance model

Because the eHealth agenda is likely to touch a number of staff across Queensland Health and impact on the day-to-day work of clinicians in the delivery of patient care as well as the way that care delivery is managed, virtually everything that goes on in the program will have a bearing on its ultimate success. This means that the eHealth program should be managed as one undertaking, and not simply as a collection of separate projects.

If the eHealth program is to be perceived as different from previous IT projects such as the former clinical information system project, then it must be structured differently. There is already a perception among more cynical members of Queensland Health staff that the eHealth program will be no different from previous programs that have been unsuccessful; this cynical view should be countered not only by what Information Division leadership say, but by what they do.

As such governance for the program needs to be integrated into the current structure and act as a catalyst for implementing a 'new' way of delivering enterprise wide IT capability within Queensland Health.

The scope of this initiative needs to consider the following:

- Implications for CIP. A key cornerstone of the eHealth program is to build on capability already in place and on projects currently in flight. Many of CIP's current projects are likely to be subsumed within the eHealth program.
- Integration of the eHealth program office with the normal structure of Information Division. Given the magnitude of the eHealth program, where it fits structurally as well as how it relates to other programs is an important consideration.
- Relationship with line of business initiatives directly related to eHealth. Governance processes that are put in place for eHealth will need to consider how best to accommodate for related line of business projects being delivered by the business outside of the eHealth Program structure.
- Business sponsorship. The governance model will need to address the need for strong business ownership of the overall eHealth Program, as well as clear business sponsorship for each program initiative.
- Sourcing of capability. Limited capacity and capability resides within Queensland Health to successfully deliver the eHealth program. As such, its success will partially be guaranteed by the extent to which assistance can be sourced externally. Appropriate governance arrangements will need to be in place to accommodate a hybrid sourcing model.

Tangible outcomes expected from the establishment of governance for eHealth

- Clarity about how governance for the eHealth program will integrate within the current Queensland Health structure
- Well thought out governance model that has buy-in from people within Information Division as well as from lines of business.

11.2 Develop the business case

(Update Comment: May 2007 – A funding bid for the 2007-08 funding cycle has been submitted to Government).

This activity aims to identify the need for additional or alternate sources of funding as well as define the benefits that will be derived from delivery of the eHealth strategy.

The eHealth strategy and roadmap defines the program of work and estimates the cost by calendar year. Benefits identification did not form part of the initial scope of work.

Before the program can be fully endorsed and funded, there is a need to understand how eHealth fits within the broader program of work of the Information Division. Current budgets are expected to be able to fund year 1 of the program, however further funding may be required for recurring years. Not until the cost estimates of undertaking eHealth and other programs such as the Infrastructure plan are known, and compared against existing recurring funding, can a determination be made about the extent of additional funding required if at all.

Both tangible and intangible economic benefits need to be identified and quantified to form part of a full cost / benefit analysis.

Tangible outcomes expected from the business case initiative include:

- A compelling case for decision makers
- Understanding of the priority areas where benefits are most likely to be harvested so that business owners can be identified upfront
- Clarity about the type of change (process, behavioural, information & technology) most likely to deliver benefits.

11.3 Develop the enterprise architecture

Having received approval from Victoria's Department of Human Services to leverage its enterprise architecture, Queensland Health intends to use it as a starting point upon which to build its own architecture. Before proceeding with the development of the architecture, there is a need to determine the most appropriate way of adopting and tailoring the architecture to meet the needs of Queensland Health.

Development of enterprise architecture is essential as it provides direction and guidance for the progressive development and rollout of information and technology solutions, while providing the flexibility necessary to allow for interim solutions and other relevant projects to be delivered as appropriate. Alignment of solutions under the umbrella of enterprise architecture ensures that greater value can be derived from investments in IT.

Tangible outcomes expected from the enterprise architecture initiative include:

- Common vision for enterprise wide information and technology solutions
- Way forward to ensure interoperability
- Helps inform the decision about which projects should be continued.

11.4 Conduct information repository technology market study

The objective of the study is to fast track Queensland Health's ability to acquire and implement a repository by undertaking a market scan of the available repository technologies. Additionally it will provide an evidence base to support the justification of the use of the information repository approach to address Queensland Health's information consolidation needs in the short to medium term. The focus of the technology market scan is to:

- Assess available technologies with respect to their maturity and appropriateness to support the planned Enterprise Information Repository
- Understand the use of an Enterprise Information Repository approach in other industries to identify best practice, learnings from unsuccessful projects and potential models that could be leveraged
- Understand the architectural approach (e.g. data replication versus real-time data fusion) and architectural components such as data matching and cleansing engines that are required to establish a successful repository.

Tangible outcomes expected from the market study include:

- A recommended approach for implementing the Enterprise Information Repository including a conceptual repository architecture
- A short-list of potential technology vendors who provide repository technologies that are worthy of further consideration
- An identification of industries and organisations that represent better practice and who have successfully implemented information repositories to address similar consolidated information needs to those required by Queensland Health
- Sufficient information to allow Queensland Health to quickly formulate a go to market approach (such as an RFI or RFT) to further evaluate and select an appropriate repository technology
- A high level cost and timeline for the implementation of an Enterprise Information Repository.

11.5 Kick-off feasibility assessments

Some of the projects currently underway in Information Division are likely to be subsumed into the eHealth program. An early decision about how and whether to progress these in-flight projects will avoid unnecessary investment in those that will be discontinued, and more quickly align and build from those that are to form part of the eHealth program. This initiative undertakes feasibility assessments of projects currently in-flight for which an early assessment could be beneficial.

Tangible outcomes expected from the feasibility assessment include:

- Avoidance of any further investment in projects that are likely to be subsumed
- Progress towards alignment of in-flight projects with the eHealth program.