12. Information management to support service delivery

12.1 Overview

Information is a key enabler in the delivery of health outcomes within Queensland. Information management services are distributed across Queensland Health, however information and communication technologies (ICT) are governed and delivered at the corporate level by the Information Directorate. The Information Directorate is responsible for all information technology (IT) development and support functions across the state. This is provided through local information technology support units located in districts to support local infrastructure and systems, and a central IT group responsible for enterprise wide infrastructure and systems. Information Directorate also has a significant role in information management by providing epidemiological, statistical and library services to the organisation.

The Information Directorate has been recently formed with the objective of better managing and integrating information services, in response to concerns regarding the current performance of the information technology function in Queensland Health. These concerns include:

- long timeframes for applications developments
- inability to implement major systems and deliver capital investments within desired timeframes
- high growth of local applications, potentially duplicating corporate investments
- no basis for benchmarking operational costs
- perceptions that the IT 'tail' wags the business 'dog'
- poor benefits realisation processes
- recurrent funding implications of the IT capital works program have not been considered
- understanding the value of many IT investments
- a general focus on process not outcomes
- governance processes that may inhibit innovation
- inadequate IT system support provided in districts
- limited training of users during systems implementation
- unclear funding models leading to a variety of pricing approaches for cost recovery.

The Information Directorate was formed out of separate information management functions that existed in Queensland Health that included a separate strategy/policy function, a statistical and epidemiology function, a central ICT service delivery function and 16 information services units around the state. This environment was characterised by varying service levels, inconsistencies in the breadth of services and standards and a lack of coordination needed to resolve ICT problems.

Information management functions, with responsibility for data analysis and interpretation, also sit within various other Corporate Office units, public health networks and in districts.

The Information Directorate has commenced the process of reforming its governance and service delivery capability in response to the concerns outlined and the needs of districts. At the time of this Review, the Information Directorate reform initiative had not had time to be visible at the district level. This is both acknowledged by Information Directorate and evident through the district consultation.

12.1.1 Information technology governance

The Information Directorate oversees an annual budget of approximately $191.5 million based on 2005-06 figures. This consists of an operating component of $107 million and a capital budget of $84.5 million. The responsibility for ICT investments is governed by the Information Directorate and sponsoring directorates through the Information Strategy and Investment Board.

The Information Strategy and Investment Board, being the peak management body for ICT in Queensland Health, is charged with ensuring that the investment in ICT is optimised to achieve the strategic objectives of Queensland Health.

12.1.2 Information technology planning

Queensland Health undertakes an annual information management planning process that results in the Queensland Health Information Management Strategic Plan. This plan is required to be developed under the *Financial Management Standard (FMS) 1997*. The Queensland Health Information Management Strategic Plan has a five year planning horizon and is one of four strategic plans that underpin the overall Queensland Health Strategic Plan. The other three supporting plans are for Assets, Workforce, and Safety and Quality.

Information Directorate also develops an annual Operational Plan that describes how they will deliver on the directions set out in the Information Management Strategic Plan.

12.1.3 Organisation of Information Directorate

Information Directorate has a total of 984 staff, consisting of 606 permanents, 232 temporary employees, 118 contractors and 28 trainees/graduates.

The Information Directorate is currently in transition from a previous structure to a new model of operation. The new model is based around the four key functions of Planning, Brokerage, Utility and Performance. These functions are implemented as four key Branches as follows:

Planning

The InfoInvestment Branch is responsible for information strategy, governance, planning, pricing, standards and compliance. This Branch also has a leadership role in relationship management with key customers, in research to track emerging technologies and learning from other organisations.

Brokerage

The InfoSolutions Branch is responsible for working with system sponsors to acquire and deliver systems that are affordable, functional, sustainable and that meet business needs. The focus is on developing the capability required to broker solutions and manage project delivery through partnerships with the ICT industry. This area assists the business to develop requirements and facilitates procurement processes. They will ensure appropriate governance over the acquisition process and manage architectures and alignment. Their role will include limited internal development, where the focus is on innovation, new technologies, and where the business cannot get better value elsewhere.

Performance

The InfoService Centre provides the point of contact for IT support and advice across the state by providing a single point of contact for customers. The Centre aims to resolve calls at the point of contact with minimal referrals to other specialists. The Service Centre is responsible for monitoring and reporting on service performance.

Utility

The InfoOperations Branch is responsible for the technical management of networks, hardware, desktops, software, and enterprise wide applications. This Branch aims for operational excellence in delivering a complete ICT service. InfoOperations is also aiming to harness economies of scale in managing ICT assets.

The Information Directorate has proposed transforming the Health Information Branch (which has data management, statistical, epidemiological and library functions) into a fifth area called InfoAccess. This process was put on hold pending the outcome of this Review.

The Information Directorate is focusing on enterprise wide applications which are defined as applications that:

- perform specific functions to directly support mandated health service functions, processes and procedures; or
- store data for which policy, regulation or legislation requires a level of security that cannot be assured locally; or
- have been categorised as very high or extreme risk in the Queensland Health Integrated Risk Management Framework.

Applications that do not fit this definition are classified as local applications. Local application services are planned to be located in Health Service Areas and Districts, and a process is underway to separate out staff of the InfoOperations Branch that support enterprise systems from those supporting local applications. Staff supporting local applications will become district employees.

The Transformation project has been established as the change agent to improve performance and encourage a more customer focused culture in Information Directorate. The Transformation project is structured around a program of work aimed at defining new functions, processes and systems needed to attain a quality service delivery capability in Information Directorate. The Transformation project is positioning the Directorate for the two to five year horizon.

12.2 Current project initiatives

There are currently 44 projects being managed within the ICT Capital Acquisition Program. A general update of these projects is provided to each Information Strategy and Investment Board meeting. A more detailed formal assessment was undertaken in January 2005. At that point in time there were 45 projects underway with the following status:

- 5 projects were progressing successfully and given a green status
- 28 projects were assessed as having some risk of failure and required assistance to improve the outcome. These projects were given a yellow status
- 12 projects were identified as having significant risks and were given a red status.

The 44 current projects have been consolidated into five major programs being:

- the Clinical Informatics Program (CIP)
- the Resource Management Program
- the Decision Support program
- IT Infrastructure
- Infostructure.

Each of the projects in these five programs is briefly described in Appendix 12.1.

12.3 Key systems

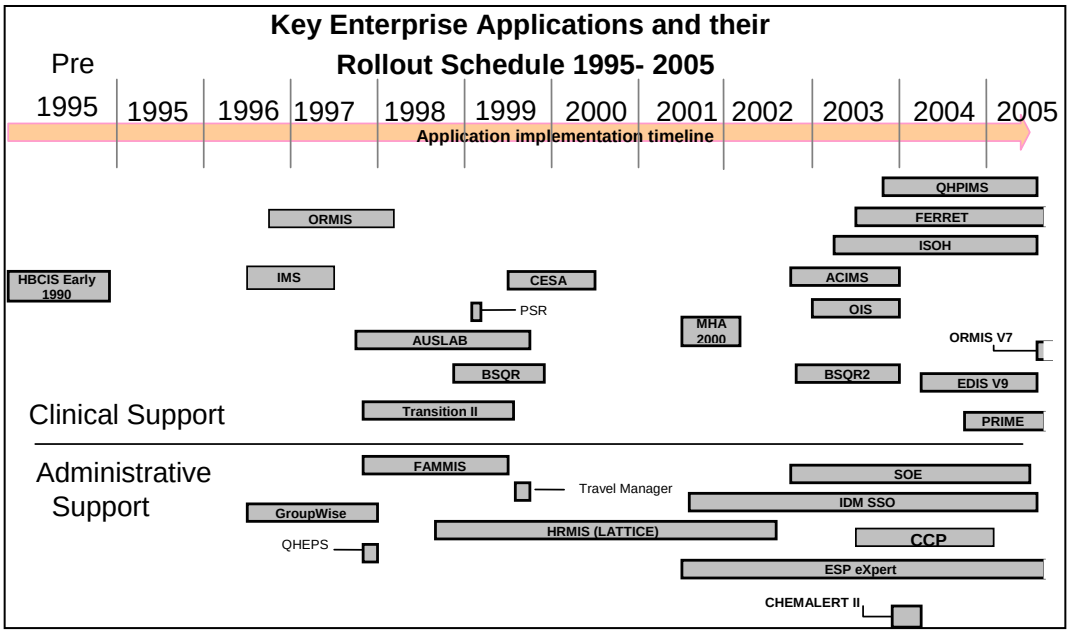
Within Queensland Health, applications are classed as either enterprise wide or local. There are estimated to be in excess of 7,000 local applications in use in districts and this figure is growing quickly with many small applications being developed to meet specific local needs and/or to cover the slow delivery of enterprise systems supporting clinicians.

For a system to be classified as enterprise wide, it must be endorsed by the Information Strategy and Investment Board.

Not all enterprise wide systems are supported by the Information Directorate. For example, systems such as the AUSLAB pathology system, the FAMMIS financial and materials management system and the Lattice human resource management system are used across the state, but they each have support units within directorates other than Information Directorate.

The table in Appendix 12.2 provides a list of currently supported enterprise wide systems, including their acronyms and descriptions.

A broad timeline for the historical rollout of enterprise systems is provided in the following diagram:



The above rollout schedule of enterprise systems and the 44 projects listed on the IM/ICT Capital Acquisition Program suggests priority has been given to development of administrative and clinical activity reporting systems rather than to systems that provide point-of-care support for clinicians.

Whilst the Clinical Information System Project has a clinical systems focus, its development has been protracted and core information needs of clinicians remain largely unmet.

Higher priority needs to be accorded to providing point-of-care support systems for clinicians. If this need cannot be met in a timely way through the enterprise wide strategy, then a short-term strategy that will achieve rapid implementation of clinical point-of-care applications (for example in targeted areas such as medical specialty, surgical specialty, allied health and community health etc) must be instituted as a practical demonstration of Information Directorate's capacity to effectively deliver support systems for clinicians.

12.4 Governance of ICT

12.4.1 The Information Strategy and Investment Board (ISIB)

The ISIB was formed in recognition of the need to improve ICT governance through better alignment of IT strategies with health service needs and improved investment processes. The ISIB has three primary roles:

1. directing strategy, priority and sequence of programs and projects ensuring the ICT portfolio is relevant and supports corporate and operational outcomes
2. monitoring, evaluating and supporting ICT investment and benefits management within a governance and investment environment to achieve effective outcomes

3. approving and endorsing strategic information plans, frameworks and policies that support legislative obligations and improve health outcomes.

The governance required to bring the portfolio of planned investments back under strict project controls and into alignment with the evidence based needs for clinical and administrative systems should not be underestimated. The formation of the ISIB, under new terms of reference and with senior representation, is fundamental to achieving alignment between ICT directions and the health services provided by Queensland Health.

The InfoInvestments Branch of Information Directorate is now responsible for supporting the ISIB and is in the process of developing new strategies, processes and practices to assist the ISIB to effectively manage ICT in Queensland Health. Areas of notable gaps, such as budgeting recurrent costs as part of original investment proposals and managing benefits realisation, are being addressed by the InfoInvestments area.

The overall proposed governance approach for ICT investments and strategies appears sound. With a strong focus on governance, there is a lesser attention to innovation and generating enthusiasm for what might be possible as a result of advances in ICT. While no ICT initiative should proceed until it is adequately sponsored and resourced, Information Directorate's role must also include scanning of the market place and innovations occurring in districts so as to educate and alert the ISIB and potential sponsors to the possibilities.

The view encountered in districts was that a disconnect exists between Corporate Office decision making and districts in regard to ICT investments. Districts feel alienated from the decision making process.

The current membership of the ISIB may be contributing to the view being expressed by districts. The membership is currently heavily weighted to Corporate Office decision making, with six members being from Corporate Office, one being the State Manager of Pathology and Scientific Services, and one zonal manager.

If improvement in health outcomes are to be achieved, particularly through development of clinical support systems, a dominant representation on ISIB is required from area health services and districts. Increasing the service delivery representation will also help to remove the tendency to blame ICT failures on Corporate Office decisions and encourage greater buy in and ownership from area health services and districts in the implementation process. Dominant representation by area and district staff on ISIB will strengthen alignment between ICT directions and health services delivered by districts.

It is important for the proposed Chief Operations Officer position, responsible for business services, to be an active member of the ISIB if this committee is to ensure ICT is appropriately supporting clinicians and health service delivery within Queensland Health.

Recommendation 12.1

The current membership of the Information Strategy and Investment Board is immediately revised to include the Chief Operations Officer and to ensure a dominant representation from area health service and district managers.

The terms of reference of the ISIB broadly cover all aspects included in the delivery of ICT in Queensland Health. The two major components making up expenditure in ICT are:

- a capital expenditure of approximately $85 million per annum on ICT
- an operational expenditure of over $107 million per annum on support of ICT.

In practice, the role of ISIB has been heavily focused on managing ICT strategy and the major investments covered in the Capital Investment Program. There is no specific reference in the terms of reference to managing operational expenditure, and this has been confirmed by Information Directorate management as being outside the scope of ISIB.

The majority of this operational expenditure is incurred by Information Directorate, who is an internal provider within Queensland Health. Information Directorate's service delivery capability has attracted a high level of criticism from districts. This is acknowledged by Information Directorate management as a critical area for performance improvement by the new organisation.

This service delivery capability must be sourced appropriately and performance managed to ensure value for money is also being achieved for the operational expenditure on ICT. Information Directorate is progressing to develop an appropriate performance management framework to ensure that the quality, service delivery, costs, and capabilities are in line with health service needs and industry benchmarks. If this is not successful, there is a significant risk that basic service delivery quality issues will overshadow attempts to focus more strategically on ICT governance.

The InfoInvestments area in Information Directorate is currently responsible for performance monitoring of the Directorate's service delivery capability. This arrangement lacks independence from Information Directorate. The proposed arrangement also lacks openness and accountability to customers. Information Directorate are currently required to report performance only through line management accountability mechanisms.

This provides customers in health service districts with no visibility of service delivery performance of Information Directorate, who are mandated to provide internal services. Customers do not have the opportunity to purchase enterprise wide services elsewhere. In an internal model, such as that with the Information Directorate, a service delivery framework is required that gives customers both visibility of performance and the ability to performance manage the supplier in the event of poor performance.

The ISIB must have a role in governing the performance of operational expenditure and its' terms of reference must explicitly state this. The ISIB should establish a separate Operations Board of senior district and area health service representatives to provide independent advice to them on the performance of Information Directorate's service delivery function. This would allow the ISIB to include this within their terms of reference without overly burdening the committee with operational performance issues. The Operations Board would be chaired by a district or area health service representative and supported by the InfoInvestments Branch.

This Operations Board must have a charter to determine if Information Directorate are operationally focused in the right areas including supporting staff to provide better health services and is providing a cost effective service to customers. This will require the Operations Board to have access to service level metrics and costing data. The

Operations Board should be given a direct accountability to advise ISIB on the appropriate level of annual operational funding for ICT and any productivity dividends that could be expected as a result of quality improvements.

Recommendation 12.2

An Operations Board, chaired by a district or area health service representative and with strong district representation is to be immediately formed as an independent advisor to the Information Strategy and Investment Board on the performance of the Information Directorate.

There is a significant body of work to be finalised before Queensland Health can effectively manage its investment in ICT. The InfoInvestments Branch has been charged with implementing processes to ensure better management of investments, particularly around concept and business case development, monitoring performance and managing benefits realisation. The need for this work is essential and strongly supported by the Review findings. The recommendations above are aimed at further strengthening the governance of ICT through better alignment of investment with health service need and enhanced performance monitoring and accountability to customers.

12.4.2 Planning and performance management

The Queensland Health Information Management Strategic Plan 2005-2010 provides a clear overview of the principles and objectives that guide Information Management in Queensland Health. It also provides basic information on seven strategic initiatives, some internal to Information Directorate. These initiatives document strategies and processes that will be developed rather than deliverables. The strategic initiatives do not strongly link to priorities around health outcomes and clinical practice. The focus of the initiatives is on getting the ICT architecture and infrastructure in order. It is recognised that these areas do currently need attention, but this must not be to the exclusion of initiatives that are based on patient and clinical centric outcomes.

The current Information Management Strategic Plan does not provide a clear picture of the outcomes that will be achieved with the capital investment occurring over the next five years. Further, the plan does not document any measurable performance indicators for Information Management in Queensland Health. These gaps need to be corrected in future strategic plans, with the primary focus of strategic initiatives being to support improved clinical practice and health outcomes through providing effective information systems to doctors and clinicians delivering health services to Queenslanders.

The next layer of planning involves developing an Operational Plan. The Information Directorate Operational Plan describes the role and functions of the Information Directorate and maps out in more detail the activities that each of the Branches will undertake in delivering the initiatives identified in the Strategic Plan. There is a strong linkage between the Strategic Plan initiatives and the Operational Plan. This is working well. There are, however, no performance measures documented in the Operational Plan.

The overall planning processes for IM/ICT appear to be basic in nature, which reflects the current maturity level of the newly formed Information Directorate. The strategic planning process does not provide the required five year view of how an estimated $400 million spend on ICT initiatives will support health outcomes and clinical practices, or how performance will be measured. The Information Directorate need to develop the

capability and capacity to gather and analyse the ICT needs across Queensland Health as a basis for strategic planning.

The long term implications of the ICT capital program on recurrent costs are also not currently well understood. The ICT capital program is creating new assets, beyond those that exist today. This will result in an increased expenditure on ICT support over the coming years. For example, if $400 million is invested over five years then, based on a 15 percent support cost, this would increase ICT support costs by $60 million per annum. It is not currently known if the cashable savings generated from the investments will generate enough annual savings to fund this increase or if there will be a shortfall. This needs to be monitored and managed closely by ISIB and investments with no commitment to fund recurrent expenditure need to be avoided.

The InfoInvestments area is currently in the process of implementing a clear methodology to prioritise potential investments balanced against risks, benefits and strategic priorities. This process will provide better strategic management of bids for capital expenditure, with a focus on matching bids against strategic needs and managing ongoing benefits realisation.

The major concern identified through investigating the planning process is the lack of performance measures found. This seems to be endemic through the planning and governance arrangements. A framework needs to be established that links strategic performance indicators for ICT down through operational performance indicators. The ISIB needs to be able to assess if ICT strategies and initiatives are effectively supporting the organisation (through operational delivery of ICT services) and make adjustments where necessary.

Recommendation 12.3

The Information Management Strategic Plan initiatives focus on priority areas that will improve clinical practice and health outcomes which is built from detailed gathering and analysis of needs in districts. This must include CHIME and PRIME.

12.5 Organisational structures

The overall Information Systems Delivery environment in Queensland Health is recognised as being in need of improvement. This is evidenced by many factors including:

- A history of significant problems with enterprise applications, which can be partly attributed to quality issues in the central IT function.
- Clinical staff in Queensland Health often lack the information management skills to specify their needs and manage the associated change required for successful delivery of ICT eg ICT projects are often viewed as technical solutions that are the responsibility of IT to deliver, rather than as an opportunity to improve work practice and productivity afforded by use of new technology.
- A very low satisfaction level with the delivery and support of ICT services, which is not underpinned with performance monitoring or quality support processes.

The Information Directorate has specifically recognised the quality issue concerns and is investing significant resources into leaping forward in maturity in terms of both governance and service delivery capabilities. This is being addressed through an initiative called the Transformation Project. This project has been thorough in its assessment of the issues and put in place a structured program of work that, if successful, should turn around the performance of Information Directorate.

The Transformation Project is positioning the Information Directorate for the two to five year horizon, with little tangible short term results for clients. This is a complex change management initiative aimed at reforming the business processes and practices of Information Directorate. This project has a higher likelihood of succeeding than many of the IT initiatives reviewed, as the project has appropriately resourced the business process standardisation and change management, prior to implementing the internal IT systems proposed for Information Directorate. This project is, in fact, following a similar model to the one that has been proposed by the Review for all IT initiatives in the Department.

The major risk faced by the Transformation Project is the long lead time before tangible results will accrue. Implementing the IT recommendations of this Review will produce the needed short term results. The longer term gains from the Transformation Project will be less at risk if they can leverage off some short term tangible results.

There is a further risk that Information Directorate, even post the transformation project, will become overly bureaucratic and control focused. The Operations Board, recommended in section 12.4.1 must have a role in mitigating this risk and ensuring Information Directorate focus on service delivery outcomes.

12.5.1 Benchmarking

Information Directorate currently has 984 full time equivalent staff. This number is broadly broken down as follows:

- There are 580 staff providing the operational support (i.e. keeping the systems running) for all Queensland Health applications, infrastructure, networks and computers. 407 of these staff are located in districts, with the remainder being in Corporate Office supporting enterprise wide applications and infrastructure. It is expected that 70 staff in Information Directorate will be devolved back into districts as a result of the devolution of local applications support.
- There are 41 staff involved in providing a first point of contact Help Desk for ICT problems.
- There are 153 staff involved in managing or developing new applications.
- There are 89 staff in the Clinical Informatics Program, which is the largest IT initiative currently underway in Queensland Health. These staff should be surplus to requirements (or available for new project) at the conclusion of this project.
- There are 41 staff involved in managing IT strategy, policy and investment decisions.
- There are 68 staff involved in Epidemiology, Statistical Analysis and Library services.
- There are 12 staff involved in administering the Information Directorate.

The following table provides a breakdown of Information Directorate staff who are located outside of Corporate Office. It must be noted that staff in these locations often provide service to more remote locations e.g. support for Roma is provided from Toowoomba.

Southern Zone		**Central Zone**		**Northern Zone**	
Southern Zone Office	4	Central Zone Office	12	Northern Zone Office	7
Bayside	6	Brisbane City	16	Cairns	23
Gold Coast	22	Central Qld	22	Townsville	32
Logan-Beaudesert	11	Chermside	30	Mackay	13
Princess Alexandra Hospital	46	Herston	70		
QEII	10	Sunshine Coast	23		
Toowoomba	20	Wide Bay Burnett	17		
West Moreton	23				
Southern Zone Total	**142**	**Central Zone Total**	**190**	**Northern Zone Total**	**75**
Total: 407					

Separate from Information Directorate, there are also 30 staff performing IT related duties for human resource and financial systems that transferred to the shared service provider.

In summary there are 621 in operations (estimated to reduce to 550), 242 in projects, 41 in strategy, 12 in administration, 30 in Finance and Human Resource systems, and 68 staff are not IT related (i.e. Information management staff recommended in section 12.6.1 to be located in the Performance Directorate). Excluding the 68 staff not performing IT duties, Queensland Health has a total of 946 staff in the IT function.

The Information Directorate oversees a total budget of approximately $191.5 million based on 2005-06 figures. This consists of an operating component of $107 million and a capital budget of $84.5 million and represents 3.5 percent of the total Queensland Health budget. The operating budget of $107 million can be further categorised into:

- Information Directorate labour and administrative costs of $64 million.
- Asset replacement (e.g. PC replacement) for Queensland Health of $13 million.
- System hardware maintenance and licensing fees of $19 million.
- Communications (e.g. Wide Area Network) of $7 million.
- Other (e.g. grants, library subscriptions etc) of $4 million.

It is estimated that the total healthcare IT market in Australia is worth $1.7 billion. Given total health system expenditure of approximately $55.3 billion this represents an investment of approximately 3.2 percent in IT.[110]

This shows Queensland Health slightly above the national average, although it must be noted that benchmarks vary greatly in the health IT area ranging from 1.5 percent reported in the UK up to 6 percent reported in USA.[111]

The Queensland Government's total annual expenditure on ICT is approximately $1 billion, on an estimated $25.67 billion total expenditure for 2005-06. Therefore, on average, Queensland Government spends 3.8 percent on ICT. Queensland Health (3.5 percent) is slightly below this average and accounts for 19.2 percent of the total

[110] Fujitsu, Achieving Benefits from Investments in Health IT, 2003
[111] Derek Wanless, Securing our Future Health: Taking a Long Term View, 2002

Government spend on ICT. Queensland Health makes up 23.6 percent of the Queensland Government workforce and 20.8 percent of Queensland Government expenditure. These comparisons do not show a significant variation from average, albeit Queensland Health's ICT expenditure is slightly below the average.

A general international benchmark for the health sector for total IT spending is 4.9 percent of budget, with capital spending accounting for 1.7 percent. Queensland Health's comparative expenditures are 3.6 percent and 1.6 percent respectively. On this international benchmark, Queensland Health compares well with the capital spending, but is more in line with a lower Australian Health Sector and the Queensland Government benchmark for operational spending.

In the area of staffing numbers, Queensland Health employs 946 staff in information technology roles. This equates to approximately one IT staff member to every 46 Queensland Health full time equivalent employees. This is slightly above a general "all industries" benchmark of one IT staff member to every 50 staff. The differential on this benchmark suggest that there are approximately 75 too many staff.

There are estimated to be 3,960 ICT employees in the Queensland Public Sector. Queensland Health accounts for 23.8 percent of these staff, noting that the total number excludes several agencies that have outsourced their ICT. This again compares well in regard to Queensland Health's relative size (23.6 percent of Queensland Government workforce and 20.8 percent of Queensland Government expenditure).

Comparative staff numbers in the IT area have also been made available from New South Wales Health. Recognising that New South Wales Health employs approximately double the number of staff that Queensland Health does, it would be expected that Queensland would have a proportionally smaller IT area. Looking at the three broad IT areas of strategy, projects, and operations, this assumption holds true only in the strategy area. In the projects area, Queensland has more staff than New South Wales, however this is directly related to the level of project work underway, and is of no major concern. Staff numbers in the project area will increase and decrease depending on the number of projects underway. In regard to the operations area, base staff numbers are similar, highlighting that Queensland may have opportunities for productivity improvements in the operations area. This comparison can not be used to draw a conclusive recommendation, as the systems in place for support of IT are considerably different between New South Wales and Queensland, making direct comparisons difficult.

General benchmarking data indicates that the ICT function in Queensland Health is broadly resourced to an appropriate level, but does point to the potential for productivity improvements in the operations area. However, due to the general nature of benchmarks, and the lack of detailed benchmarks that compare other factors such as complexity and industry specific factors, this conclusion should be taken as a guide only.

12.5.2 Centralising versus decentralising the IT function

The question of a centralised versus a decentralised IT function must be considered in terms of delivering the best outcome for patient and clinical needs. It is these outcomes that must drive ICT priorities and strategies.

The benefits of a more decentralised approach to the ICT function include:

- The ICT support for clinical and patient needs would be close to the coalface, resulting in responsiveness to needs.
- New systems that are developed would be more likely to be owned and optimally designed to meet clinical and patient needs.
- IT strategies and priorities would be conceived by those responsible for health services, rather than by IT people.
- The ICT function would be more flexible and agile in meeting local needs.

The benefits of a more centralised approach to the ICT function include:

- Much greater ability to interchange data and support external connectivity across the continuum of care.
- Efficiencies can be achieved from one system servicing 37 districts as opposed to 37 different solutions.
- Greater consistency in data capturing, interpretation and analysis to support area and corporate service planning.
- Systems integration is feasible and more cost effective.
- Removes overlap and duplication.
- Easier to maintain ICT skills with a larger scale.
- Greater consistency in ICT support processes.

It is clear that to achieve the best result for clinical and patient needs requires a balance to be struck between the level of centralisation versus decentralisation. Either extreme would result in many of the important outcomes being missed. To deliver these outcomes, the model proposed is one of centralised coordination and management of the ICT function, but with ICT services being delivered as close to the coal face as possible (i.e. decentralised physically).

The proposed model is captured as follows:

- The overall management and coordination of the ICT function is centralised.
- ICT strategies and priorities are determined by the ISIB with support from the central ICT group. Strong processes of engagement are needed to ensure ICT priorities and strategies are driven by clinical and patient needs. The central IT groups focus in supporting ISIB must be to drive processes that ensure strategies and priorities are developed and owned by the stakeholders (i.e. strategies and priorities should not be developed by IT staff, they should be reflecting the needs identified through strong engagement processes).
- ICT service delivery performance is managed by an Operations Board with independent accountability to the ISIB.
- The development of new IT systems must operate as a decentralised function, although working to consistent and coordinated processes from the central group. ICT development projects would exist within a business group under a sponsor for the duration of the project. This could be a district taking on the role of developing and piloting a new solution prior to it being rolled out enterprise wide, or a system wide sponsor driving the project at a state wide level. The ICT expertise for these projects needs to be coordinated and sourced from the central

pool, but is accountable to the business sponsor for the duration of the project. The business sponsor is accountable back to ISIB for the projects performance. Information Directorate would source the ICT skills and expertise and provide methods, architectures and standards for the ICT development. Information Directorate still have a significant role to play to ensure the system integrates with the overall ICT environment and to ensure the ICT project has appropriately skilled resources. Project related issues are discussed in more detail in section 12.7.

- The operational ICT service delivery function continues to be provided by IT staff who are on the ground in districts, but accountable back to the central ICT management group for consistency and quality of service.
- In the problem resolution area, there needs to be a shift to more remote resolution of problems to increase efficiency and timeliness of problems being fixed. The number of ICT staff stationed in districts is unlikely to alter greatly if the numbers of supported devices increase in line with the recommendation of this Review. The recommendation to increase the number of devices in districts is documented in section 12.8.2.

Structurally, this model is not dissimilar to that being implemented by Information Directorate. However, there is a distinct difference in the organisation of governance and accountability. There is a much stronger accountability placed on Information Directorate for meeting service delivery expectations, managed through the Operations Board. Conversely there is a much greater accountability on area health services and districts for driving ICT strategies, priorities and delivering new systems.

Recommendation 12.4

Queensland Health continue to centrally manage and coordinate ICT resources with specific ICT functions delivered within the following parameters:

- ICT strategies and priorities are to be driven by clinical and patient needs, which are gathered and reported to Information Strategy and Investment Board by Information Directorate.
- New ICT systems are developed by systems sponsors, with all project staff reporting to the system sponsor for the duration of the project. The sponsor is accountable to Information Strategy and Investment Board for the performance of the project. Information Directorate will source the ICT skills and provide the methods, architectures and standards to be met in the ICT development.
- Information Technology Units will continue to be located in districts to meet the on the ground needs for ICT support.

12.5.3 Alignment with organisational structures

Having established that there is a requirement for centralised management and coordination of the ICT functions, it now needs to be determined where this function should fit within the organisational structures. Sourcing strategies for a centralised ICT function also need to be considered.

The ICT function has both a policy/strategy coordination role and an operational role. These functions are best kept together to ensure that the operations areas are delivering technical services that meet the overall strategy for ICT in Queensland Health. A separation of these functions would likely result in a larger ICT strategy/policy role and

the need for additional compliance activities to ensure the operations area(s) are delivering appropriate solutions. Given the complexity of the ICT agenda and the importance of it being successful, the additional layer of bureaucracy associated with separating strategy and operations is not warranted and would add little value to the outcomes.

The fundamental accountability for performance and strategic alignment of the ICT function sits with the ISIB. This is a subcommittee of the board of management. While this governance arrangement continues at this level in the organisation, the ICT function should be held directly accountable to the Board. The performance of ISIB will be a key determinant in the success of ICT in Queensland Health.

The Information Directorate is predominantly providing a support service to the organisation. Structurally therefore, the Information Directorate would logically fit within the proposed Chief Operations Officer section of Corporate Office.

Recommendation 12.5

That the Information Directorate structurally report to the Chief Operations Officer, but is directly accountable to the Information Strategy and Investment Board for ICT strategies, priorities and performance.

Sourcing options for information technology services include internal provision, outsourcing or a combination of the two. The current approach of Information Directorate is largely internally sourced, with the exception of large system developments which are often tendered for in the open market.

A fully outsourced model for ICT services would be difficult to pursue, given the current maturity of ICT services in Queensland Health. Significant productivity and improvement can be expected from Information Directorate over the coming years, particularly in the InfoOperations area. Outsourcing a service in an environment where the longer term ICT needs are not well known or defined would place the organisation at significant risk of ICT being more costly and not well aligned to needs.

In the current environment, an internal approach, which is focused and rewarded for improving service delivery, will produce greater dividends. Supplementing internal capabilities for large projects or where skills are not available internally should also be pursued. It is acknowledged that Information Directorate are currently supplementing skills will external partners, and this approach should continue.

In particular, alternative sourcing arrangements need to be pursued for new applications development. Sourcing internal skills in project management, web development and other applications disciplines has proven problematic. Particularly in project management, public service pay rates do not equate with the size and complexity of many projects, resulting in contractors being used. This means increased costs with arguably greater internal risk, due to the temporary engagement of contractors. An appropriate methodology for project managing contractors should be established by the Information Directorate covering project planning, performance standards, reviewing progress, monitoring achievement of deliverables and target dates, achieving skills transfer to internal staff and controlling contracts expenditure.

The ability to be flexible and agile in meeting new needs for project development is problematic due to the bottleneck in internal skills available and Public Service Award

constraints. An example is the PRIME system, which is a small web style development being released in three stages. The timeframes for release of stages are constrained by the internal availability of web developers and along with many other priorities need to be scheduled in a sequential manner. Alternate sourcing strategies, that allowed external capabilities to be engaged for individual developments would result in much greater parallelism, shorter delivery times for clients, and greater ability to keep pace with the capital program. These external engagements would need to be done with organisations with suitable capabilities and pre-qualified to deliver to Queensland Health standards. A preferred supplier panel for applications development and project management services would provide the greatest flexibility and agility in meeting demands for ICT developments, with internal staff focusing on overall project management, contract management, requirements specification and technical due diligence.

Recommendation 12.6

The InfoSolutions Branch establish pre-qualified panels to provide applications development and project management services for the Department.

The InfoOperations Branch, of Information Directorate, is being restructured around providing holistic management of services in preference to being structured around specific technology areas (eg networks, desktops and hardware support).

This area has the greatest potential to reap productivity improvements. It is acknowledged by Information Directorate management that opportunities exist in this area, as no significant productivity dividend has been gained from the amalgamation of 16 separate Information Services Units into a single management environment. Modern technologies that allow remote diagnostics and resolution of problems can reduce the need for on site visits and increase efficiency and turn around times. However, this approach would result in a reduced number of IT staff employed in districts. The InfoOperations Branch recognises that these productivity dividends exist, but concerns over reducing regional employment have not yet been addressed.

The potential productivity dividends are very broadly estimated to be between 75 and 100 staff in the InfoOperations area. While the recommendation to increase the number of desktops will offset some of these productivity dividends, it is also clear that the new systems of support will require different skill sets to be successful.

If Information Directorate is not able to make these skill set adjustments and productivity savings quickly, then the ability to reach efficient and effective service levels will be compromised. Longer term, if these adjustments are not made, the option of outsourcing operational service may become the only viable alternative to achieve the level of service and efficiency required.

While there will be industrial issues to consider, these need to be addressed in order to make small staffing adjustments now, rather than facing the longer term threat to all staff from outsourcing.

The proposed approach is for Information Directorate to expand the scope of the Transformation Project to make determinations on the levels of staffing required. The current approach of the Transformation Project is only to consider a split of staff between local and enterprise support, based on an assessment of what staff are doing today, rather than considering the level of staff required to deliver the function, and adjusting resourcing to that level. The scope of this activity needs to be changed to consider the

appropriate level of staff required for the function, so that specific functions can be targeted and positions abolished that are surplus.

It is acknowledged that the increase in desktop numbers, recommended in section 12.8.2, will likely increase the staff numbers again, but in different locations and with different skill sets.

To fully realise these productivity dividends will require additional investment in technology tools and processes for the management, support and administration of the computer fleet. Information Directorate will need to immediately progress this as a priority capital infrastructure project.

Recommendation 12.7

Information Directorate pursue productivity dividends from the InfoOperations area by:

- Immediately implementing a project to improve work practices and implement technology tools, including remote diagnostics and resolution of problems.
- Undertaking an assessment of the resource levels required in each functional area and identifying surplus positions, and as productivity gains are progressively realised, by
- Abolishing surplus positions, with incremental increases of staff occurring in other areas, with different skill sets, in line with any demonstrable requirements arising from the desktop expansion.

12.6 Information Management

12.6.1 Information management responsibilities

The term information management is being used here in the context of the manipulation, re-organization, analysis, graphing, charting, and presentation of data for specific management and decision-making purposes. Information management in the broader context also includes administration tasks associated with creating, modifying, managing and disposing of information.

The focus of information management should be on making appropriate information available for use in planning, decisions making, and performance monitoring. This includes information derived from within the organisation and the facilitation of access to and use of information external to the organisation.

The information management function is not well understood or resourced across Queensland Health. The Information Management Strategic Plan recognises this and has flagged a strategic initiative aimed at improving information management competencies.

The two primary issues that have been identified relate to quality of data and levels/competency of resourcing.

Firstly, the quality of data held in many systems has been questioned by the people who input or use the data. This occurs for a number of reasons including:

- Clinicians who are entering the data are often not the beneficiaries and do not see value in data entry
- Inadequate training has occurred on systems

- Systems themselves are slow or cumbersome resulting in minimal entry of data or systems not being used
- The data is not analysed or interpreted for local use and therefore the value of initial input is questioned.

Secondly, the impact on local staff is not being adequately defined or planned for when new systems are implemented. Competencies in managing information are scarce. This has been evidenced in district visits as follows:

- The impact of data entry, data analysis and reporting from new systems needs to be understood and planned for in the implementation process, rather than expected to be added to existing workloads.
- Business cases should identify changes to work patterns and any resource shifts needed to gain the benefits of the new system.
- The implementation of information systems should be adequately resourced including data entry, analysis and reporting.
- The role of managing information, including extracting, analysing and interpreting data for use in decision making in districts, area health services and Central Office needs to be appropriately resourced and skilled.

Recommendation 12.8

New enterprise wide ICT projects need to identify the impact on end users in terms of data entry, data analysis and reporting. Resources for any additional workload must be built into the business case and agreed before systems development commences.

Recommendation 12.9

Information management, including extracting, analysing and interpreting data for use in decision making across the organisation must be appropriately resourced and skilled.

The analysis and interpretation of information that is occurring in Queensland Health is currently performed in a disparate environment with little overall coordination. The analysis and interpretation of information is broadly resourced as follows:

- The Health Information Branch in Information Directorate provides statistical analysis, epidemiology services, data standards, ad hoc data analysis, surveying services and library functions. Staff include data managers, statisticians, epidemiologists and librarians. The major focus of this group is corporate level reporting (eg to Queensland Treasury and the Commonwealth) and support for policy, planning and program evaluation, although services are provided to districts when requested, within workload capacities and limited reports are made available for all Queensland Health staff to access.
- Staff are employed in districts to undertake benchmarking, trending of data and clinical coding. The role of these staff is focused on using data available from decision support systems such as Transition II, to report on clinical and financial indicators.
- Some staff exist in zones and statewide service areas, who are undertaking detailed analysis and interpretation of data to assist with service planning.
- Public Health Services Branch in Health Services Directorate has epidemiologists employed in the central planning and research area as well as a small number of epidemiologists and data managers within the Public Health Unit Networks.

- The Innovation and Workforce reform Directorate also have a data analysis group.

These groups work independently in servicing their clients, but often overlap in the data they are analysing and interpreting. A level of tension exists between some of these groups over the accurate definition and interpretation of underlying data.

Further, there is often no single reference point and a lack of standardisation of data, resulting in different results depending on data sources used, assumptions made and interpretation.

The disjoint nature of data analysis and interpretation leads to a lack of focus on strategic information management and use of data to guide decision making in the organisation. In the future, more attention will be required to ensure that the data captured is aligned with the strategic needs of the organisation and the knowledge generated is captured and managed across the organisation. As a first step, Queensland Health would benefit from a more coordinated approach to analysis and interpretation of data, with a specific goal of supporting service planning, quality and safety and monitoring performance. This should be allowed to mature over time to provide greater levels of knowledge generation and dissemination that supports the strategic needs for service planning and performance.

The central Health Information Branch is well positioned to support corporate level activities and data standards setting. This group provides a corporate centre of excellence in data analysis and interpretation. It is proposed that this group focus on core central needs of the organisation as follows:

- support for corporate level reporting to Queensland Government and the Commonwealth
- corporate data analysis and interpretation to support the central policy development and planning function
- corporate data analysis and interpretation to support the central performance monitoring and evaluation function
- data standards
- library services
- leadership in information management capacity building across Queensland Health.

In delivering these functions, Health Information Branch would be best aligned with the corporate planning and performance monitoring areas. This will ensure that Health Information Branch is closely aligned with the needs of the people it is supporting and has a clear purpose and role in the organisation.

Area health services will require a stronger capability in data analysis and planning to support area health service planning and performance reporting. Staff undertaking these roles need to be situated in area health services. However they should have close links and networks with the central Health Information Branch. Information produced by area health services will need to be rolled up in a consistent manner to a corporate level by Health Information Branch, so it is important that these groups work closely together.

Further, it is critical to develop and maintain skills and corporate knowledge in data management, statistical and epidemiological services across the organisation. Area health services may find it difficult to source and maintain skills in statistical and epidemiological services. A data management and epidemiology analysis network could

be created to address this issue. This network would take on a capacity building role, including:

- Programs of rotation between area health services and Health Information Branch
- Succession planning across organisational and bureaucratic boundaries
- Structured training activities focused on lifting the level of information management skills and standardisation of data

A similar relationship needs to be developed with district staff undertaking local analysis and benchmarking roles. While these staff will have a core responsibility for providing information at the district level, greater coordination and skills development is required in order to ensure the analysis and interpretation of data becomes more consistent over time.

Generally the staff involved at a district level in analysis and management of information are finance officers (largely using Transition II) and Health Information Managers (HIMs). There is much to be gained from these groups of staff working together to enhance the provision of relevant information to local clinical units. In particular the information management skills of HIMs could be utilised in a much broader range of roles including but not limited to:

- working with clinical staff to identify information needs for clinical units
- working with finance staff to maximise the clinical relevance of reporting using the Transition II system
- supporting clinicians by managing the information aspects of a range of quality and safety processes including death, clinical and complications audits
- providing a timely and responsive audit of local data quality and
- providing training in a range of information management skills.

Recommendation 12.10

Health Information Branch focus its role to service central policy, planning, performance and evaluation, and leadership in information management standards. The function is to be structurally incorporated into the Performance Directorate.

Recommendation 12.11

A data management and epidemiology analysis network should be established to develop and maintain critical skills across the organisation in data management, statistical and epidemiological services.

12.6.2 Information islands

Queensland Health has many IT systems with a wealth of data stored for various service delivery and reporting needs. Access to this data in a manner that assists districts in service delivery planning has been identified as an issue - "we are drowning in data but have no information". Information exists in silos across the organisation with no current integration, data standardisation or data warehousing solution that can bring this information together to support local decision making. This is a weakness in the current environment that needs to be architected and planned for in future systems developments.

Many systems are not integrated, resulting in duplicated time spent entering data into different systems. It has been recognised for some time that a unique patient identifier is a primary key to integrating information across systems e.g. if a patient presents at two different health services, a patient identifier would facilitate the matching of records. The

current Client Directory Project aims to provide common patient identifier functionality within the Hospitals Based Corporate Information System (HBCIS). It has been rolled out to seven of the current thirty-two HBCIS sites across Queensland Health. The issue of a patient identifier needs to be progressed as an urgent business priority for all patient related information systems. In the medium to long term, resolving this issue will provide a fundamental building block for system integration and will lead to simpler clinical care, as it begins to eliminate the need to locate multiple medical records. Enhanced data standards settings and consistency in data interpretation will complement the integration of data across information systems.

Recommendation 12.12

The definition and agreement to a standard way of identifying patients across ICT systems needs to be progressed as a high priority initiative, as this forms the basic building block from which IT systems integration can begin to occur.

The technology implemented by Queensland Health not only needs to support internal processes, but needs to be able to connect to external providers such as general practitioners, private hospitals and non government organisations to streamline the management of consumers across the care continuum. This is well understood at the strategic level, but has not yet been evidenced in business models and supporting technology capability to make this happen.

Recommendation 12.13

Systems need to be designed with connectivity to external providers, such as general practitioners, private hospitals and non-government organisations, as a key consideration.

12.7 Delivering ICT projects

12.7.1 Business sponsorship of projects

Sound project management dictates that a project sponsor is identified prior to commencing a project initiative. A project sponsor is someone that has ultimate accountability and responsibility for the project and advocates the project at a senior level to ensure the necessary financial and human resources are available. The sponsors' role includes overseeing the business and project issues and chairing a Project Steering Committee. A sponsor generally needs to be someone who can fund and be accountable for the outcome. The sponsor ideally should have ownership of the business processes and the control or influencing power to deliver change in the business areas affected by the new IT system.

In Queensland Health, in some instances it has been difficult to identify sponsors for projects involving enterprise wide applications. Three scenarios exist in the Queensland Health environment, as follows:

- The system is infrastructure related, servicing multiple 'business areas'. Examples include services such as GroupWise, Client & Provider Directories, and the Standard Desktop Operating Environment. In these circumstances, Information Directorate has taken on the sponsorship role in the past. In the future, Information Directorate must have no role as a sponsor, and the Chief Operations Officer (or nominee) will take on the sponsorship of these systems.

- The business area is a statewide service with a clear owner e.g. Pathology is run on a statewide basis. In these circumstances, a statewide sponsor is easily identified, who has responsibility and accountability for the business on a statewide basis.
- The business area is not run as a statewide service. It is this scenario that provides the most difficult of circumstances, where there is no overall responsibility or accountability for the business area.

In the third scenario above, a need for a new system is often identified, with districts agreeing it is a priority, but the lack of a sponsor can inhibit initiation and progress of the initiative. With the lack of a clear sponsor, with the power to drive change and business process standardisation, projects are highly unlikely to succeed as an enterprise wide initiative.

The emergence of clinical networks provides an opportunity for these projects to be progressed through a network of skilled people with the influencing power to affect change in the business. This does not negate the need for a sponsor, but provides the sponsor with a mechanism to affect the necessary change that will be associated with the implementation of a new IT system. To be successful, projects will require a senior sponsor, who may be elected from within the clinical network or be someone responsible for the success of the clinical network.

Queensland Health has not progressed ICT initiatives in the absence of a sponsor. However, in some cases the appropriateness of the sponsor has been questioned in regard to their level of influence in the area being progressed. Any proposal for an ICT initiative that cannot identify a sponsor who has the control or influencing power to implement any changes required in the business area should be rejected by the ISIB. The assessment of new ICT initiatives should include an evaluation of the appropriateness of the proposed sponsor.

The role of a sponsor is often a demanding one. When placed on top of an existing job, without adequate support resources, it can be difficult to do justice to the role. Sponsors need to be resourced appropriately and may require training and development support to effectively perform the role. The overarching culture needs to be one where sponsors are supported so that they can be successful in implementing major initiatives, rather than a culture of pinpointing someone to blame in the event of failure.

Recommendation 12.14

New enterprise wide ICT projects should not be progressed until a system owner (sponsor) is identified with the control or influencing power to drive the associated business change across the organisation. Provision of adequate funding and resources for sponsors must be identified and funded through initiative budgets prior to commencement.

12.7.2 System and process standardisation/simplification and change management

There was a clear message of support for common enterprise wide approaches to information systems. This view was maintained regardless of the delivery issues being experienced with many enterprise wide IT initiatives.

To achieve enterprise wide information systems will, by its very nature, require business areas to agree standard ways of doing things. Processes and business practices need to be streamlined and standardised if the goal of implementing statewide systems is to be achieved.

In practice, the business areas of Queensland Health often leave business process standardisation and change management as issues to be resolved by an IT initiative. This is a 'throw the project over the fence to IT' mentality which has contributed too many projects being slow to deliver, having cost overruns or failing altogether.

If large enterprise wide IT implementations are to be successful, project sponsors need to be resourced and accountable to define, agree and implement standardised business processes. This definition and agreement should happen prior to the commencement of any IT development.

No project should be approved as an enterprise wide IT development until it can be demonstrated that a consistent and agreed business process has been designed. For clarification purposes, standardising business processes does not equate to building inflexible IT solutions. Areas of flexibility should still be incorporated, particularly where one size does not fit all eg small hospitals may be undertaking simpler procedures that require less information to be captured.

Queensland Health needs to adopt an approach of piloting redesigned business processes and associated IT systems in one Hospital or Health Service District first. The results of pilots need to be evaluated and built back into the final solution before enterprise wide implementation occurs. Project plans must build in time and budget contingency to allow for rework as a result of pilot learnings. In the past, this has not always occurred.

The effort involved in delivering the business change should not be underestimated.

There are few examples of IT developments that are driven as a component of a business focused reform initiative. Where this has happened, success has followed. A good example is the pharmaceutical system which was lead by a team of dedicated pharmacists who drove business change, standardised processes and tackled difficult issues to clear the path for an enterprise wide IT system.

Generally though, the existing structures within Queensland Health require a tripartite agreement between two Corporate Office Directorates and the sponsoring area in order to be successful. In order to drive the appropriate reform, a program approach that brings together the technology, business and change skills is required. Within the current structures, this would involve the Information Directorate for the technology skill, the Innovation & Workforce Reform Directorate for the change skills and the relevant sponsoring area as the owner and driver of the initiative. Given competing priorities, bringing these three entities together and aligning resource availability, timing, and direction to a given program can be difficult. Yet this is a fundamental requirement that should be in place before commencing any large IT project that involves changes to business processes. Under the newly proposed model these three functions are to be brought together under the sponsor.

There are many indicators of insufficient attention being given to delivering business change including:

- District staff have reported that systems are often developed based on insufficient clinical input and that clinicians need to be more closely involved in the development/acquisition of IT solutions. In practice, however, all systems development activities appear to have had a level of input from clinical staff. This problem appears to reflect more on a lack of effectiveness of the clinical input to influence directions and a lack of communications and change management processes being employed to the broader audience.
- Historically there has been little focus on benefits realisation or consideration of the benefits realisation capabilities in districts. For example, their capability to manage change and the ability to deliver both cashable and productivity based benefits.
- Business cases, when developed, do not have commitment to the outcomes from district management responsible for managing benefits realisation. Consultation and robust debate appears constrained to the formal structures of a project, such as the Steering Committee.
- There is no process in place for the ongoing evaluation of IT systems to ensure they are operating as planned, benefits are being realised and the systems are not negatively impacting on staff. It is noted that Information Directorate have acknowledged this issue and are proposing new processes for evaluating benefits realisation.

The culture of independence and autonomy that is associated with professional knowledge workers, such as those making up Queensland Health's workforce, makes communication and change a more complex task than it would be in a process based industry, as the initiatives are trying to overcome a culture of specialised professional independence.

This leads to broad communication and engagement processes being a critical part of change initiatives. The level of effort involved in consultation, requirements gathering and business process standardisation will be significant. Done properly, the cost of initiatives will increase; however, the ability to achieve the benefits possible through the application of IT will also increase.

A program approach is required for large initiatives where sponsors are identified and resourced to deliver changed business processes in conjunction with the IT initiative. There is clear support for an enterprise wide approach to ICT systems where there is a common need across Queensland Health.

Recommendation 12.15

Enterprise wide development of ICT systems should continue where there is a common need across Queensland Health. Investment in the design and implementation of standardised processes and practices must occur as a precursor to initiating ICT developments.

12.7.3 Tailored solutions

Districts frequently raised a concern regarding the amount of tailoring of IT solutions undertaken in Queensland Health. A common view expressed was that Queensland

Health cannot be that much different to other states or other health organisations, so why can't Queensland Health just implement an off-the-shelf solution that is working somewhere else. An example of this is the AIMS system used for incident reporting in other states. Rather than use this solution, in place in three other Australian states, Queensland Health developed PRIME, which was not viewed positively by staff in district visits. It is noted that the decision to implement PRIME was appropriately made by senior management as an interim solution based on timeframes set by the Commonwealth and cost issues with other options, resulting in choosing the least cost option.

A further view expressed was that Queensland Health spends considerable money in ensuring the last 20 percent of nice to have functions are developed into IT solutions yet significantly under fund the implementation and change process. A potential solution to this issue is to accept systems will only meet the core requirements (ie meet 80 percent of user needs) in the initial implementation and promote hard-lined decision making around this minimal functionality. Saved investment could then be used to ensure implementation issues were adequately dealt with.

The current approach is trying to do too much and ending up not doing it well. This also leads to concerns with the time to rollout systems in Queensland Health. Long information technology development lead times can result in technology being dated before it is implemented.

These issues all point to a need to implement minimal functionality well in the first pass and get a working solution on the ground and evolving over time, rather than a big bang approach.

Recommendation 12.16

When implementing new ICT systems, a more robust decision making process is required to balance the costs and benefits of tailoring solutions, with a strong bias towards implementing core functionality only in the initial implementation.

12.7.4 Training

There is a general lack of computer proficiency across Queensland Health, particularly in clinical areas. Although it was observed that some clinicians are highly skilled in the use of computers, there are also a significant number of people in the workforce with limited understanding or exposure to information technology. This includes lacking general keyboard skills, making entry of data difficult, and general awareness of computer systems and tools, such as word processing, spreadsheets and the Internet. This exasperates the level of frustration experienced with IT systems and causes difficulty in providing system specific training due to the vast differences in general proficiency.

An investment in general computer skills is required for clinical staff that have lower proficiency in IT systems. This needs to be separate to any training provided with new computer systems. The goal is to lift the general ICT capabilities across Queensland Health in preparation for a greater dependence of clinical systems that support work processes into the future. Continuing to deliver major new clinical systems in the current environment will lead to further issues with training, system acceptance and the quality of data being captured.

It is estimated that half of the clinical workforce, including VMO's is in need of some level of basic computer training. At one extreme are those with very little exposure to computers, where it is estimated that 5 days (40 hours) of training spread over a year would be beneficial. The other area of training need are staff that have had some exposure to computers but lack the level of skill or confidence to undertake there role effectively. In this case it is estimate that 3 days (24 hours) of training would assist in raising their level of proficiency.

Averaging these assumptions leads to about 50,000 days of training required to lift the level of computer proficiency for clinical staff.

There is limited internal capacity or capability in Queensland Health to deliver ICT training of this scale over a short period. There are some ICT trainers employed in districts, but in general, it is only the large districts that have the required capability. These groups normally operate on a fee for service basis.

The only other internal training function identified was Rural Health Training Units, which have qualified trainers, but do not currently provide training in the area of ICT. Expanding the role of these groups to include training in basic ICT skills would be advantageous in that ICT training could be included as an adjunct to other training being delivered. In the smaller rural locations, providing a holistic training service that can be delivered in line with the needs of the district is a distinct benefit.

The option of using external organisations to develop and deliver training is also an option. Organisations that specialise in training, such as TAFE colleges, Learning Network Queensland or other qualified ICT training organisations, could partner with Queensland Health to design and deliver ICT training.

A major consideration in designing an ICT training program is the delivery mode. That could include distance education; self paced learning, individual tutoring, classroom programs or a combination of these. In the case of classroom delivery, suitable facilities also need to be identified.

A training exercise of this scale would be expected to be delivered for around $100 per person, per day. This cost should include an analysis of training needs and tailoring of delivery to meet local requirements, but is based on classroom style delivery for small groups.

The total estimated cost of such a training program is $5 million.

In order to achieve the best training outcome for individual areas and districts, a single statewide approach is not recommended. Rather each area should determine the most suitable delivery option(s) to meet the needs of the area. This may leverage existing capability available from ICT trainers in districts or Rural Health Training Units or involve partnering with external organisations. Each area would also need to conduct a training needs audit to ensure that training is appropriately targeted.

The timing for delivery of this program would be best linked into the desktop expansion process recommended in section 12.8.2. By linking these two recommendations together, it will ensure that training coincides with an increased availability of desktop devices on which clinical staff can put new skills into practice.

Recommendation 12.17

$5 million is provided to improve the basic ICT proficiency of clinical staff through the state. Areas are to determine the method of training delivery. The delivery of this training is to coincide with the planned program for computer expansion recommended in section 12.8.2.

The level of training provided in new IT systems has also been raised as a concern. In some cases there was insufficient training provided to system users and in some cases the training occurred weeks before the system was installed, resulting in training being forgotten. There was a case where training was reported as being too extensive, and a lesser amount would have been more appropriate. It is expected that different users, due to there different levels of IT proficiency, will view training as either too little or too much.

The more important issue is to ensure training occurs at an appropriate time and there is follow up support in place, post the implementation, to assist those users who are experiencing difficulties. This could be in the form of on site support for a period of time or a locally acknowledged 'super user' that staff can turn to. Training by classroom style delivery does not always work in with busy clinical staff, resulting in training being missed by users. In some cases, pursuing on the job training strategies may be more effective in reaching all potential users.

Recommendation 12.18

Training users, on the job in new systems needs to coincide with the implementation of the system and be backed up with on the ground support, particularly over the initial months of running a new system. Full training costs need to be included in the project business case.

12.7.5 Project management capability

Project management disciplines and methodologies are lacking in Information Directorate which is contributing to the poor delivery capability of Queensland Health for large IT system implementations. The capability of a project manager for a given project is a key determinant of success, as there is no guidance to ensure consistency outside an individual's capability. This issue has been recognised by Information Directorate who are in the process of resourcing a project Delivery Office to manage governance, methodologies, logistics and provide core capabilities to project initiatives. The aim of the Delivery Office is to provide a primary skill set required to successfully deliver large corporate IT Projects. The progress of the Delivery Office needs to be monitored to ensure that project management disciplines do not contribute to project failure in the future.

Queensland Health has a track record of utilising staff, such as clinicians, with appropriate content knowledge but little project management experience to run large ICT initiatives. This practice has led to insufficient project management skills in delivering projects in the past, and should be discontinued unless the individual has appropriate project management skills.

Further, project funding arrangements do not lend themselves to skills continuity and attraction of highly skilled resources for projects. Project funding is temporary by its very nature. Attempts to attract high quality applicants to temporary public servant positions have not been overly successful, often resulting in the employment of highly paid contractors as an alternative. Further, whether temporary public servants or

contractors are used for projects, skills continuity and knowledge loss is problematic when projects close down after completion.

To successfully manage large ICT projects that involve external organisations in the development and delivery of the system will require strong contract management skills. Selecting an appropriate partner, for the size and scale of projects likely to be run in Queensland Health, will require a high calibre of skills in undertaking due diligence processes, contract negotiation and contract management. The lack of skills in this area, particularly in exercising appropriate due diligence, has significantly contributed to failure of IT initiatives in Queensland Health. Similarly to project management skills, high calibre contract management skills are also difficult to maintain in temporary roles at public service pay rates.

Concern was raised as to whether value for money was achieved through use of short term contractors and consultancies. In respect to contract project management services, areas of perceived concern include insufficient monitoring of contractor performance and inadequate definition of project scope, deliverables, project methodology and project timelines. There are 118 contractors currently engaged by Information Directorate representing 12 percent of total staff (984). Several contractors have been engaged for extended periods and a review of the contract term would appear warranted.

Recommendation 12.19

Information Directorate should:

- seek commercial partners with proven expertise in project management and contract management in preference to employing temporary or contract staff as an alternate model for project management.
- undertake an immediate review of the contract term of current contractor and consultancy services and confirm the ongoing need for each service.

12.8 Technology gaps

12.8.1 Application priorities

There have been a number of gaps reported in the coverage of IT systems during the Review. The following were identified as priorities:

- An enterprise wide system(s) to support ambulatory and community care.
- A focus on point-of-care support systems for clinicians including infrastructure solutions to support the mobility of users both within the hospital environment (eg tablet devices that can be used as a nurse moves around a ward) and for external access (e.g. VMO's being able to remotely access information systems or Community Health workers being able to access systems when on home visits).

In additional to these gaps, two existing systems warrant special mention as priorities for improvement, as follows:

- The ESP rostering system is an unsatisfactory solution for rostering and nearly all districts continue to use EXCEL for rostering and then duplicate the information into ESP. A suitable system needs to be implemented as an immediate priority to remove the non-productive entry of data through the current ESP interface. This priority

needs to be actioned separately from any long term project to replace the Lattice Payroll system.

- There is an urgent need to roll out the PRIME solution across the state in line with recommendation 9.8. Recognising that PRIME was proposed as an interim system and that new requirements are evolving in the Quality and Safety area, it is unlikely that PRIME will meet longer term requirements without significant enhancement or redevelopment. A review of functionality of PRIME (including proposed future releases of complaints and risk management functionality) needs to be undertaken in light of the recommendations made in this Review and a strategy for future systems enhancements or replacement needs to be identified and agreed. This should be considered a priority decision area. This decision must also consider the benefits of pursuing a standardised solution in line with the system (AIMS) being adopted by other states and territories.

Further, Queensland Health has experienced difficulties with delivering new clinical systems in the past. Since development of the Hospitals Based Corporate Information System (HBCIS) in the early 1990s, Queensland Health's successful experience with implementing large information systems has principally focussed on administration systems (eg finance and human resource management) rather than on implementing front end clinical support systems. The current high profile Clinical Information System Project (CIS) offers opportunities to improve outcomes around clinical practice. The CIS is a core module of the strategically important Clinical Informatics Program and the Information Directorate's reputation amongst clinicians and district staff and support for the enterprise system approach will be significantly influenced by their assessment of how well the CIS initiative is delivered.

The current capital acquisition program for ICT needs to be reviewed in light of the recommendations of this Review. Decisions to invest in systems have been made based on Queensland Health priorities at the time. The results of this Review will impact on the strategic priorities for developing ICT systems, particularly those within the Clinical Informatics Program, the Resource Management Program, and the Decision Support Program. Each of the projects in these areas needs to be reviewed in light of the recommendations of the Review and the reconstituted ISIB needs to determine if they should proceed or not.

Projects within the IT Infrastructure and Infostructure Programs are core ICT requirements and should proceed without need for formal review.

In determining the program of ICT investments, consideration needs to be given to the level of change occurring within Queensland Health and the base skills of clinical staff in operating ICT systems. A purposeful slowdown in release of new systems, while basic needs are met, such as access to computers and training of staff would be advantageous. It is recognised that priority developments need to occur.

Recommendation 12.20

Reprioritisation of ICT initiatives in line with the recommendations and priorities outlined in this Review is to be agreed through the reformed Information Strategy and Investment Board within 3 months.

12.8.2 Desktop facilities

A Standard Operating Environment (SOE) is in place for the Queensland Health desktop environment. This ensures a level of consistency and ease of support of the IT environment.

However, access to desktop computer facilities (desktop computers, laptops and printers) is a concern in most districts. Clinical staff reported issues with gaining access to a computer to undertake their duties. Examples include doctors not being unable to access a computer on a weekend because the only workstation is locked by a user who has not logged out and staff needing to book computer time in advance to get access to the Internet for research purposes.

The current environment encourages restrictions in the number of computers available in districts as they are managed as a financial line item in district budgets. When new systems are rolled out they do not consider the needs for desktop access. This is left for districts to budget. This can lead to systems not being implemented or used effectively because districts do not have the budget flexibility to increase the number of desktop devices. This is counterintuitive after spending significant funds in developing an enterprise wide application.

Currently there are 23,743 desktop computers and laptops and 6,800 printers servicing a total of 43,782 full time equivalent staff in Queensland Health.

The penetration of devices in the corporate and administrative areas is 100 percent with all staff having full time access to computer facilities. In clinical areas of districts the penetration would be much lower. Districts (including administrative and clinical functions) have, in general, desktop or laptop computer numbers equivalent to between 45 percent and 50 percent of the FTEs employed.

An annual PC levy is used in Queensland Health to fund the full cost of running a desktop device including its replacement. Once penetration of desktop devices reach 100 percent, the PC Levy presents less of a problem as the funds are established as a recurrent expenditure. While in a growth phase (increasing to 100 percent penetration), the PC levy results in districts having to redirect recurrent funds from other areas to fund the PC Levy associated with any increase in computer numbers. No other source of recurrent funds has been identified to assist districts with managing the requirements to grow their computer fleet.

The PC levy is being openly directed back into the desktop environment. On current numbers, the PC levy would raise $37 million in revenue of which $18.3 million is allocated to Information Services Units for staff to support the desktop, $11.6 million is allocated to Information Services Units to replace computers and printers, and $7.1 million is used to fund license fees associated with software on the desktop and servers.

A process needs to be established to raise the level of computer availability in districts to ensure the availability of desktop equipment for those needing access. This will require an injection of money into the provision of desktop devices in a manner that does not place an additional burden on district budgets.

As a broad indication, it is estimated that raising the desktop availability to around 65 percent should meet immediate needs. This would provide an additional 5,000 units across the state for deployment in clinical areas. It must be stressed that this is a broad indication of scale and a more detailed process of determining needs has to be followed before finalising cost estimates.

However, based on this indicative requirement, increasing the desktop fleet by 5,000 units will incur both a one-off and recurrent cost. The one-off cost of 5,000 units including on costs such as Local Area Network devices, cabling and infrastructure required, is estimated at around $25 million. The additional annual cost is approximately $7 million based on the current PC levy.

In addition to being only broadly indicative of numbers, in practice the use of mobile devices, which can be carried around wards etc, may be used in preference to desktop computers. This may alter the financial equation slightly. By undertaking a more detailed analysis of needs, Queensland Health can ensure the computer expansion, which is clearly necessary, is done in a way that meets the most urgent needs first and does not over service any areas.

Once a base level is established, all future enterprise wide ICT projects must consider any impacts of the desktop fleet and identify a source of operational funding in the business case, if there are any significant impacts.

It is proposed that a pilot upgrade to meet the optimum desktop needs is undertaken in a cross section of hospitals and community health centres and used to project better estimates across the state. This would include a small rural hospital (e.g. Laidley), a hospital and community health centre in a regional district (e.g. Bundaberg), a hospital and a community health centre in a larger regional district (e.g. Redcliffe) and a very large teaching hospital (e.g. Royal Brisbane and Women's). The pilot would be expected to take 6 months including the time to access the outcomes, affirm to government the full cost of rollout and undertake planning for the ensuing rollout.

Recommendation 12.21

A pilot upgrade for desktop expansion is undertaken in 4 representative hospitals and 2 community health centres within 6 months and rolled out to all districts over the following 12 months. The results to be used to project total needs across the state. This is indicatively estimated at around $25 million in once off funding and $7 million per annum in recurrent expenditure.

Internet access in Queensland Health is not freely available to all staff. Besides the issue of access to a computer, staff need to apply for and be granted permission to access the Internet, which is password restricted. This practice is aimed at ensuring staff have a legitimate reason for Internet access and reducing lost time from personal use and adverse implications from inappropriate or illegal use of the Internet from work provided facilities. The maturity model that is evident as organisations go through the adoption of the Internet as a tool available to staff generally follows a cycle of initially restricting access to only those with a business case. Then, as the numbers increase, it becomes evident that the processes of approval and managing moves, adds and changes to staff are extremely costly and the original reasons for restricting access are no longer relevant as the majority of staff have access. It is usually at this point in time that organisations choose to provide Internet access to all employees and manage exceptions rather than continue trying to manage the initial access process.

In Queensland Health there are currently 4,183 staff with access to the Internet. While this is less than 8 percent of staff, it still represents a significant number of people. With this level of access, processes would need to have been established to monitor usage and manage exceptions as well as continuing with managing the process of moves, additions and changes.

Internet access is a tool to support clinical research into best practice interventions. Staff need adequate access to information technology including computers, the internet and printers. Consideration should be given to opening up full Internet access to all staff and monitoring usage rather than managing access. A whole of Government policy exists that provides guidance for the appropriate usage, training, and processes around providing Internet access from work computers. The policies and guidelines need to be implemented to ensure the Department's risks are managed.

Internet access is currently charged back to users at $360 per annum. This would generate approximately $1.5 million in revenue for Information Directorate. This fee should be removed and associated bandwidth costs need to be managed as a corporate responsibility. It should be noted that productivity gains are expected by removing the administration associated with maintaining registers of approved users that will offset some of this revenue loss. Upgraded access to the internet should be piloted in one district to assess the service (eg network bandwidth) and cost impacts and related risks prior to its expansion to all areas within Queensland Health.

Recommendation 12.22

All staff with computer access need to be given access to the Internet, with appropriate policies and training being established to manage the associated risks. Any associated infrastructure costs (e.g. network bandwidth) need to be managed as a corporate cost.

12.9 Supporting the IT environment

12.9.1 Problem resolution

The zonal based Help Desk structure for reporting IT problems was not viewed as being responsive to the needs of districts. The Help Desk provides the initial point of contact for the majority of IT users throughout the state and the quality of service delivered through this interface is often how IT sections are assessed. This interface is not currently providing a high level of service and is detracting the image of the Information Directorate. Statistics on number of faults and resolutions times for the month of May 2005 are presented in the following table.

Zone	Number of incidents per day	Average time to log and resolve fault	Fault s resolved at point of contact
Northern Zone	260	2.9 min	32 percent
Central Zone	529	5.6 min	40 percent
Southern Zone	310	5.7 min	34 percent
Total	1099	5.1 min	36 percent

Information Directorate has acknowledged this area as a problem prior to this Review and is in the process of amalgamating the zonal help desk structure, and developing consistent processes and service levels. This includes developing new processes to track reported

problems through to resolution (rather than a hand off and forget) and increasing transparency of performance through reporting.

The Help Desk is proposing to provide a one stop shop for all information management needs. The Help Desk provided the full gambit of services for enterprise wide systems but provides a referral service only for issues that relate to local applications. The Help Desk currently operates from 7:30am to 5pm and is planning a trial of extending the service to 10pm at night. The Help Desk is aiming to achieve higher resolution of issues at the initial point of contact in order to be successful in adding value to the IT support function. Targets have been set for increasing the current 36 percent resolution rate up to 60 percent in the next 12 months. If this can be achieved, Information Directorate will be approaching best practice benchmarks.

The second level of support is provided by the InfoOperations Branch in Information Directorate., which is the largest area of Information Directorate consisting of 580 staff. This group consists of a central group and 16 Information Support Units located across the state. Service delivery and support capabilities of the 16 Information Support Units is variable across the state and there is an identified need to improve consistency in service delivery outcomes.

Historically, when issues arose, coordination of resources required to resolve the issue was problematic. The resolution of IT problems occurred more as a result of the tenacity and dedication of staff rather than a coordinated and designed process to effectively respond to problems raised by customers.

This area has a high potential for productivity improvement as detailed in section 12.5.3.

12.9.2 Service level agreements

The model for service level agreements follows that of system development sponsorship, with a statewide system sponsor proposed to take responsibility for enterprise level negotiations on service levels. In some cases the system sponsor will be someone with statewide responsibility for delivery of a service and in other cases it may be a chair of a clinical collaborative/network. There is no direct negotiation and agreement with districts, other than through the system owner.

This model creates a distance between districts and the level of service being negotiated on their behalf. It is important the information technology systems are meeting the needs of users who are delivering front line patient care. Any proposed model needs to ensure the IT systems perform in line with the needs of these users and must at least have processes in place to gather these requirements – even if a statewide service level is the final product. Information Directorate see this as the role of the system sponsor. However, evidence from the field indicates that this is not occurring in many cases.

Further, other than through the Help Desk, the only mechanism for a district to raise performance or support issues is to escalate them though a system sponsor. Districts therefore have a lesser influence on Information Directorate's resource allocation. This environment leaves districts somewhat powerless to directly influence the level of service they receive. The interests of districts must be paramount in Service Level Agreements established between Information Directorate and system sponsors, detailing the range of services provided and performance standards expected from enterprise systems. The

respective responsibility and accountability of Information Directorate and system sponsors to districts must be clearly articulated in those Agreements. Districts should be encouraged to highlight instances of poor system performance directly to the sponsor, Information Directorate and the Operations Board.

Recommendation 12.23

Head agreements for individual applications should be negotiated with the system sponsor for inclusion into an overall Service Level Agreement with each district specifying all services delivered in that district. Management and reporting on service levels needs to occur directly with both districts and sponsors and will also be monitored by the proposed Operations Board.

12.9.3 Enterprise wide versus local applications

The model being proposed for information technology responsibilities is to clearly delineate between systems deemed as enterprise wide and those in place for local use only. This delineation is aimed at quarantining the resources and budget associated with providing robust enterprise wide applications, which otherwise could be eroded over time through the growth of local applications. A further objective is to create accountability in districts for resourcing the support of locally grown applications, a discipline that generally does not currently exist, and to not stifle local innovation. The primary concern from Information Directorate of proceeding with the current model is that they are trying to be all things for all people and not doing anything well. The aim of the Information Directorate is to focus on quality outcomes in the enterprise wide environment.

Enterprise wide systems broadly include the applications, infrastructure and networks. Further, the infrastructure and networks provided by Information Directorate would also support local applications. However the development and maintenance of local applications is the responsibility of districts.

The Transformation Project underway in Information Directorate is in the process of separating resources in the 16 Information Services units, located in districts, into those that support local and those that support enterprise applications. The resources involved in supporting local application are then proposed to be devolved back to the districts.

The early indications from this process are that it will be successful in the larger districts as the resources significant enough to effectively make a split. In smaller districts, there is often only one resource, and splitting is not pragmatic. The result in these circumstances is that the resource remains with Information Directorate and a 'best endeavours' service level is to be agreed for support of local applications ie priority will always go to enterprise wide applications work.

This situation represents a risk to both Information Directorate, who need to provide 'best endeavours' support for an unknown and fast growing list of local applications and districts, who have no understanding of the overheads being incurred as a result of well meaning staff trying to improve their work environment.

There is also a risk that the ISIB will not have a clear picture of the total ICT assets in the organisation and there could be some duplication in costs through local application development. However, the ISIB is appropriately focusing on governing the major strategic enterprise wide investments. This risk is considered small in relation to the overall information technology environment in Queensland Health.