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Information Technology and Telecommunications in Health in Queensland

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This paper is based on work undertaken for the Queensland IIB (Information Industries Board). It discusses issues related to the development and adoption of *clinical systems* in the health sector in Queensland. Clinical systems are defined as being those that directly support clinical practice and influence patient outcomes, as contrasted with systems of an administrative nature. The paper presents an approach to justification and ideas about methods of partnering between health organisations and the IT&T Industry.

1. Introduction and Overview

The Queensland experience of clinical systems is not unique. Across the board, investment in IT&T in health care has been overwhelmingly dominated by systems that support the management and administrative functions. Systems that support the actual business of health, ie. the delivery of health services to patients are few and far between.

Those that do exist are often created by well-motivated and well-intending clinicians who have bucked the system and found their own ways and funds to develop and implement the systems. Unfortunately, in many cases, the absence of the rigour of a professional IT approach has resulted in systems unsuitable for wider use or further development. The fact that these systems exist proves that clinicians believe IT&T can aid in their practice of medicine.

However, the problems with clinical systems mainly relate to building the business case, the complex processes involved in gaining organisational support and access to suitable development funds, and in establishing effective commercial arrangements with industry. This is typically a foreign and unfamiliar world for clinicians.

The processes involved in justifying investments for clinical equipment, e.g. CT Scanners, etc., and their implementation, by way of contrast, are relatively well defined and understood. Given that clinical systems also support the practice of medicine, why should their justification and implementation be so complex and problematic? Is it just because there are computers involved?

The key themes for change discussed in this paper have been distilled from input gained through selected research and a consultation process involving focussed workshops and structured interviews. This paper firstly calls for a **new approach to justifying investments in clinical systems**.

Consideration of the particular aspects that information technology brings to play need to be included, as it does form an important element of the solution. These include things such as security, standards, etc. However, as the clinical system is an aid to clinical practice it should be justified and funded in the same manner as other clinical investments. The current organisational, and cultural environment in the health care sector create the primary factors that inhibit the adoption of clinical systems.

Managers of the health system face difficult investment “choices”. These are usually presented as:

- a piece of equipment that directly aids the clinician in their work of patient care,
- or for a computer.

While the options are presented and considered in this simplistic manner, the required investments in clinical systems will not occur. The choice instead needs to be something like this:

- a piece of equipment, e.g. a CT Scanner,
- or for a system, for example, that enables the sharing of clinical expertise to remote and lesser-resourced facilities.

The justification for both of these investments should centre on improved clinical outcomes, and be supported with a sound financial plan. This change in the justification model for clinical systems will require clinician leadership, and a

view of information technology that places it as a practical tool that improves clinical practice, like any other technology resource.

Clinical systems have a major impact on patient outcomes, through early diagnosis, more effective treatment plans, etc. It is often argued that there is no money available for computers as it is required to save lives. Clinical systems save lives too.

In summary, clinical IT investments need to be justified in terms of clinical and patient outcomes. Justifying the investment is one critical aspect of clinical systems, the other is of course the manner in which they are to be funded, developed and implemented. This paper also calls for a **new business model for the development of clinical systems**.

The new model has two main characteristics. These are:

- ways of partnering that provides a “win” to both the Health Organisation and to the IT&T industry.
- developing Queensland skills and capabilities.

Partnering with government agencies is acknowledged as new territory. Success demands commitment, the right approach, discipline, professionalism, and appropriate resourcing. A process based on a mature approach to doing business with agreed principles, and an effective and publicly acceptable acquisition process is required. This will provide Health Organisations with solutions to their clinical systems needs, and provide local industry with an opportunity to develop skills and capabilities to address wider markets. This industry development aspect is a key Queensland Government objective.

In order to create an environment that is described in this paper, it will be necessary to introduce a number of measures designed to stimulate the required changes.

The first is about funding. Funds from outside the normal operational budgets of Queensland Health will be needed to establish a program of partnering arrangements and innovative projects. These would be selected to get the ball rolling and to put some early runs on the board. The funding for these initial projects would phase out over a period of time, and then be provided on an on-going basis through a budget and planning process developed within Queensland Health business units specifically for their clinical systems. Other external sources could also be targeted for funds, e.g. from pharmaceutical companies, clinical equipment suppliers, etc.

The second is about defining ideal business and commercial arrangements between Queensland Health and the partners from industry. This of course will be done in co-operation with those in the government responsible for setting purchasing and partnering policies. It should be noted that this process may also have application in other areas of government activity.

And the third is about the development and implementation of a process that enables acceptance of on-going investment in clinical systems within Queensland Health.

2. Clinical Systems - The Current Situation

Over the past 50 years or so, there have been a number of important changes in the process of delivering health services. The trend towards specialisation of services has produced a higher degree of fragmentation in service delivery. This trend has accompanied a change of the care model for patients of being more episodic than whole-of-life.

Organisationally, there has been a trend from clinicians managing major service delivery activities to non-medical managers. This trend has developed through two pressures. Firstly, the increasing complexity of medical services requires more time of the clinician; and secondly, the increasing focus on managing assets and budgets. It is with regard to this historical context that the paper is presented, and in recognition that there are entrenched positions in many areas that are strongly defended, both at an individual level and also at a professional, organisational and cultural level.

Three main groups were consulted in the process of preparing this paper. They were:

- Clinicians
- Local IT&T industry representatives
- Health system and information resource managers, and policy makers

When asked to describe what it's like to do business in clinical systems in health in Queensland, all the groups held similar views. There were no dissenting views about how difficult it is. The requirement for change very clearly exists for all involved. This paper treats this as a given.

The following points (Table 1) describe aspects of the current situation. These are taken directly from participants of the workshops and the interviews conducted in the preparation of this paper. As such, they represent opinions and not necessarily facts.

<ul style="list-style-type: none"> • Structure: “Turf wars” cause lots of problems - medico / nursing / admin, as well as within the disciplines. • Who has responsibility for clinical systems? Lack of project initiation process. How is accountability handled? • “Zealots” exist in both the health and industry domains. Requirements and capabilities are misunderstood. High rate of changes to technology. • Industry doesn’t know who to “sell” to; vast array of structures, people and pretenders. Clinicians get good access to industry, but have nothing to offer. Misleading signals. Who makes the purchase decision? Who has the money? • Resourcing: No funds budgeted for clinical systems; time and skills for business case development are lacking. Requirements / benefits not well defined, hence no funds - a vicious circle. • Desire for partnering - no process to follow. Is Queensland Health up to it? Innovation not supported. 	<ul style="list-style-type: none"> • Three stage tender process disadvantages “helpful” industry players. Leads to high costs all round. • Perceptions that industry is inappropriately driven by a need for profit, and that health wants everything for free. • Position on Intellectual Property not clear and issues not understood. Access rights to other markets not defined. • Priorities - what are they? Casemix has political focus at the moment. • Concerns over lack of patient care continuity. Clinicians are buried in paperwork, especially nursing staff. • Business justification - IT investment based on cost savings, etc. - is this relevant for clinical systems? IT not viewed as improving patient outcomes. • Communications - lack of consistent messages; left-hand and right-hand issues; industry capabilities not well known to clinicians.
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Table 1

This is a summary of the issues raised. It doesn’t paint a good picture, and clearly indicates that change is necessary. The most common observation is that the current investment justification and funding processes for IT&T projects are well suited to administrative systems. These are relatively easy to justify on a cost saving, or productivity basis and therefore “fit” easily into the traditional IT&T way of doing things.

This contrasts with the justification process for other “clinical technologies”, where the key determining factors are improvements to patient outcomes and clinical practice. These benefits are quantified where possible and are then supported by a cost/benefit analysis.

3. Business Cases for Clinical Systems - a New Approach

This paper suggests that the same basic methods, processes, guidelines, etc. that are currently used to justify other clinical investments be also used to justify clinical systems. In this sense, there isn’t really anything “new” being proposed. Rather that a current and accepted management process be improved and adopted for these types of systems.

The differences between clinical systems and the IT&T systems that currently dominate Queensland Health can be described in Table 2, at right.

This table indicates how incompatible the processes for the current management systems would be for clinical systems. It is observed that these differences are the root cause of much of the frustration felt by all parties involved in clinical systems.

Given that there are differences, and that these warrant a different approach, it is necessary to design a process that helps

Management	Clinical
Justified primarily on financial and productivity grounds	Justified on clinical & patient outcomes
Supports the process of management	Supports “core” business - ie. clinical practice
Requirements generally well understood	Specialised clinical knowledge required to define needs
Budget and planning processes exist	Weak budget and planning processes
Market relatively well served by industry	Relatively few products and “aware” suppliers
Straight forward product development cycle	Integration of specialised clinical equipment
Often automates existing processes	Usually involves new and changed processes

Table 2

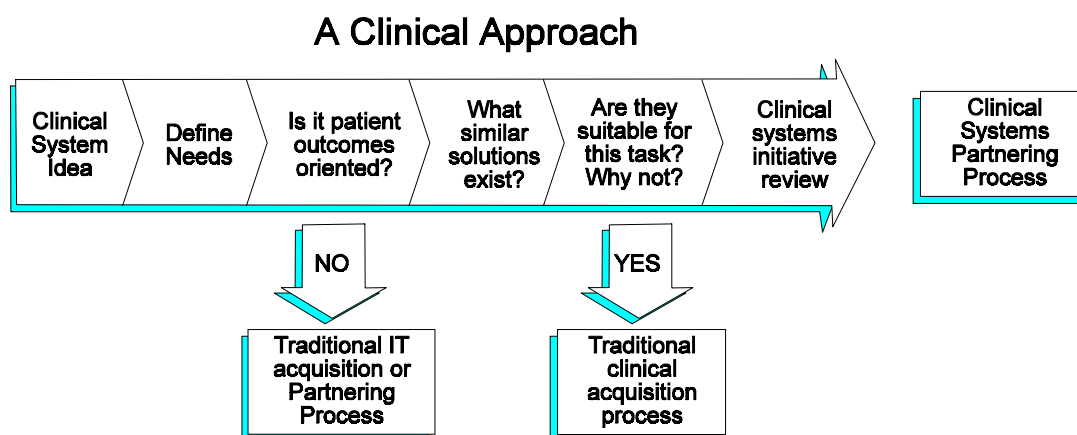


Figure 1

to identify and then to progress the justification, development and implementation of clinical systems.

Figure 1 provides such an approach. This approach is compatible with the current process of justifying other clinical investments where clinical Technical Committees and the like, review submissions to establish the clinical “worthiness” prior to embarking on the development of the detailed business case and implementation plan.

The degree of worthiness is based predominantly on clinical outcomes, as is the case with other clinical technology investment proposals. It is noted that some technology aspects, such as imaging and equipment interfacing standards, should also be considered for other clinical technology investments. This could be achieved by enhancing the function of existing peer-group clinical review committees. The selection and compliance with technology interfacing standards should be seen by clinicians as empowering them to provide improved health services, and not as an obstacle.

This paper suggests that at this stage in the development of the clinical system, ie. after endorsement is achieved in the Clinical Systems Initiative Review, that the Clinical Systems Partnering Process be undertaken (see Figure 1). This partnering process is described in the next section, and is illustrated in Figure 2. In summary it includes the public selection of an industry partner, the joint development of a business case and detailed specification, and the establishment of business partnering arrangements.

The process described in Figure 1 also enables the partnering process to be undertaken for other system needs, if it is considered appropriate. For example, it may be appropriate in certain circumstances to enter into a partnering arrangement with a supplier for a non-clinical IT system when development is required. This may also be appropriate for instances where industry perceive the opportunity to gain some competitive value through collaboration. The partnering process described in the next section is not intended, nor designed to be exclusively for clinical systems.

As with other clinical investments, it is necessary for clinicians to take a leadership role in this process. It is recognised that this process may require new skills for clinicians, and that it will be necessary to implement a program to develop these. Time constraints are identified as a key issue for clinicians who are involved in clinical systems. Measures that allow them the time and resources required to drive this process will be required.

“Wheel re-invention” is an issue identified by many people who are concerned that it is costly and time consuming to have development projects under way that have apparent overlaps in a number of respects. There are opinions through out the spectrum. Some people suggest that having the one single system operating across the State for a specific need is best, while others consider that it inhibits flexibility and imposes a “one size fits all” scenario. There are also options in the middle ground.

Despite the apparent duplication, this paper suggests that it would be advantageous, particularly in these early stages, to have projects under way that do indeed overlap and may in some form be considered as competitive. Diversity is also required while the process is evolving. The reasoning for this will become clear in the next section that deals with industry partnering and product development.

It is suggested that a corporate body within Queensland Health, be responsible for endorsing and co-ordinating the portfolio of clinical systems developments. An important role for this body is to identify which elements of the clinical systems *should* be common and what parts *can* be different. It is suggested that it is more important to have standards for data and data access, than for “whole” systems that include the user interface and data access methods.

The most significant element of the process illustrated in Figure 1, is the Clinical Systems Initiative Review. It is at this stage that a clinical systems project is given a comprehensive review. This would include a preliminary business

case addressing costs, clinical and patient outcomes, and technology standards. When approved as an Endorsed Clinical System, it would then enter the Clinical Systems Partnering Process.

4. A Partnering Approach for Clinical Systems

After an idea for a clinical system has been developed to the point where it has been endorsed as a clinical systems initiative, a process of justification and development is required. As Queensland Health is a State Government body, it is a requirement that any process adheres with the fundamental principles of the State Purchasing Policy. These in summary are:

- Open and Effective Competition
- Value for Money
- Environmental Protection
- Ethical Behaviour and Fair Dealing
- Enhancing the Capabilities of Local Business and Industry

This paper suggests that the opportunity exists to create a new model for the development of clinical systems.

A model that addresses the needs of:

- Queensland Health;
- State Purchasing Policies; and
- Local IT&T Industry.

The State Government has recently been investigating the subject of partnering, joint ventures, and other collaborative arrangements. The policy makers will be receptive to an innovative, well-defined and efficient partnering program.

Some early initiatives that bring industry into the process sooner than has been the traditional approach have revealed that the interests of all concerned can be protected and that all parties stand to benefit from this new approach. Research also reveals that a number of similar initiatives in health are under way in other parts of the world. The requirements to reduce costs and time frames, and to ensure the interests of all those involved are addressed, are common across all parties consulted for this paper.

Clinical systems are well suited to a partnering approach which includes co-operative development because of the following factors:

- Queensland Health is looking for innovative ways to improve the delivery of health services, and to implement systems that can enable the early adoption of new services.
- Industry is seeking opportunities to create competitive products.
- The development of clinical systems require specialised input from health professionals. This is a thing of value that Queensland Health has to offer.
- Queensland Health seeks cost-effective access to industry expertise in the clinical systems development process.
- Queensland Health has established a solid base of core technologies and IT support services.

Table 3, at left, describes the likely benefits of having a partnering process in place for clinical systems in Queensland.

Benefits of Partnering	
Queensland Health	IT&T Industry
<ul style="list-style-type: none"> • Promotes timely startup and delivery • Benefits come earlier • Encourages innovation by leveraging industry expertise & creativity • Offers value for money based on life-cycle costing • Responsive to evolving needs • Early access to technological and price/performance improvements • Reduces learning-curve • Products tailored to clinical needs • Additional resource base to undertake projects • Viewed as change leader - innovative • Potential to offer broader range of services with smaller investment 	<ul style="list-style-type: none"> • Reduces time and costs for bidding • Earlier notification of advice of elimination • Gives credit for innovation and creativity • Continuing opportunities to demonstrate performance • Encourages competition • Requirements based on “real” and clinically current circumstances • Client advises on trends, etc. in clinical practice • A “live” clinical development and testing environment • Client supports marketing activities • Rights to market resultant product

Table 3 (Note: Table is adapted from information in Common Purpose Procurement Process, Canadian Government; and Case Study: Washoe Health System)

This partnering style of doing business is best for situations where the following is the case, or where these types of characteristics are sought:

- The solution is not obvious
- Knowledge transfer - both ways
- Client and Supplier define and share vision
- A collaborative team relationship
- Evolutionary and co-development of solutions
- Innovation is encouraged
- Opportunity to share risks and benefits
- Focus on total solution
- Various funding sources possible

In order to create partnering arrangements that provide the benefits and have the characteristics as described above, a process that is based on that illustrated in Figure 2 would need to be developed and implemented.

This is a high level functional view. A detailed implementation plan that complies with purchasing policies, and supports the needs of Queensland Health and the IT&T industry needs to be developed.

The process of choosing an Industry Partner would be based principally on their capabilities, and would be conducted as per Queensland Government policies and guidelines.

The Partnering Plan would include:

- the preparation of a detailed business case developed in conjunction with the industry partner, which would centre on clinical and patient outcomes; and
- all the commercial arrangements, e.g. treatment of Intellectual Property, product resale rights, and marketing support.

A set of agreed principles would also need to underpin any partnering process, given the different perspectives and motivations of the parties involved. These principles would compliment the existing State Purchasing and Queensland Health principles.

Some principles which have emerged as useful in guiding co-operative ventures in clinical systems are:

- Clinicians are responsible for clinical systems initiatives.
- The client organisation is not to be distracted from its core business activities.
- The client organisation has a strategic plan for clinical systems.
- The client organisation has something to offer their industry partner, e.g. an established leadership position among their peers in a clinical speciality.
- The chosen solution requires reengineering of processes and is not specific to the particular institution. It has applicability across all Queensland Health regions, and potentially to broader markets.
- The agreement is negotiated by executive management from both parties, at all necessary levels.
- The vendor is chosen based on agreed selection criteria, such as financial stability, demonstrated performance, key personnel, alliances, etc. Basis is of “capability” instead of “functionality”.
- The client organisation demonstrates a commitment to innovation and change.
- An Open Systems attitude, philosophy and orientation is to be demonstrated by the vendor, in their technologies and in their business dealings.
- A contract that clearly outlines the terms of the agreement is to be established.

Clinical Systems Partnering Process

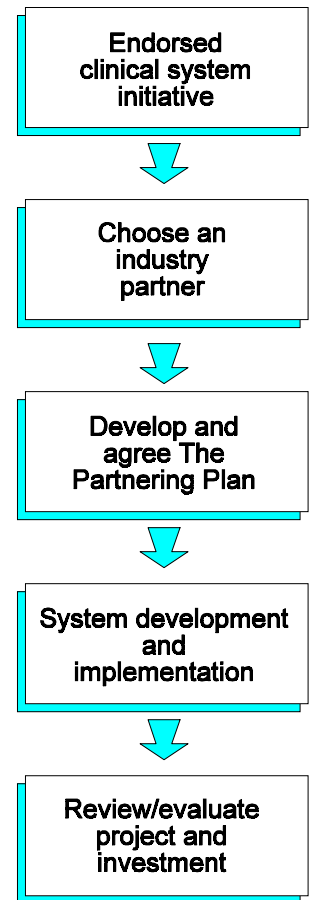


Figure 2

- All Intellectual Property and Commercialisation arrangements are agreed in advance, ie. no sod turned until.
- Respect the boundaries of the agreement. Vendors are not to look at partnerships as “back-door” sales. Client organisations are not to view the partnership as a grant or gift.
- Co-operative Project Management exists, with matching responsibility at all necessary levels.
- Clinicians with endorsed clinical systems projects have access to appropriate resources, including their own time, to progress the project.

To enter into such a arrangement requires a mature attitude from the participants. There must be a willingness to work together to achieve a common goal and a recognition that each party obtain fair value from the alliance by sharing in the risks and the benefits.

Figure 3 illustrates how the business relationship may operate in Queensland Health. By way of explanation, the basic exchange that is envisaged in this type of arrangement is that the health entity gets a product that addresses their needs, and the industry partner has a proven product developed and operational in a real-live clinical environment. The primary benefit to the health entity being the ability to provide improved clinical services earlier than might otherwise be possible; and for the industry partner, the opportunity for sales of a proven product into new markets.

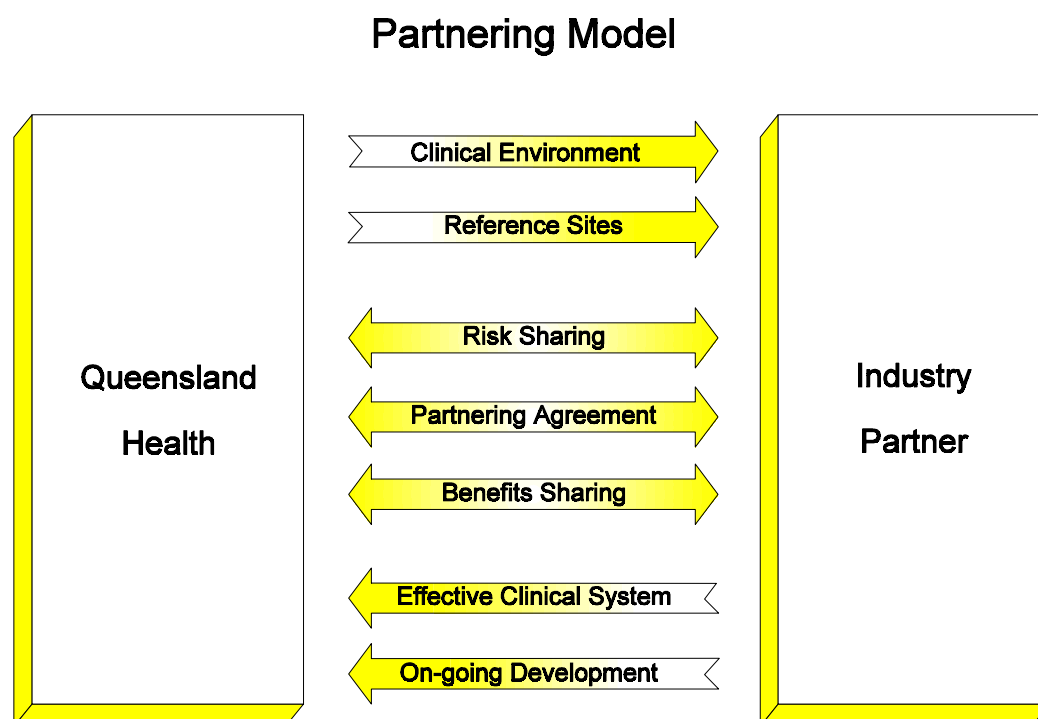


Figure 3

In the Queensland context the opportunity exists for local IT&T industry players to aggregate their capabilities to address specific clinical systems opportunities. This may also be achieved via alliances with larger organisations.

It is envisaged that a program of initial partnering projects would be established with the assistance of external funding, and that this external funding would be withdrawn as clinical systems development through industry partnerships becomes the norm in Queensland.

5. References

IIB (1995) “Information Technology and Telecommunications in Health in Queensland”. Contact Yvonne Packbier on (07) 3405 5111 for further information about the IIB’s Health / IT&T Industry Development Strategy.

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