

HIC Digital Hospital Design

Innovation Practices in Australian Healthcare

October 2016



About this paper

This paper was commissioned by Cisco as part of its commitment to stimulating debate about the role of technology and innovation in healthcare. The paper was authored by Brad Davies from Vector Consulting and draws heavily on the HIC Digital Hospital Design Conference held in Melbourne in July 2016.

Context and purpose of this paper

Healthcare providers recognise that their capacity to capture major clinical and administrative benefits is influenced by their ‘digital maturity’. Creating the next wave of efficiencies and productivity savings will require much more sophisticated strategies and approaches and will almost certainly rely on the extent to which organisations are able to:

- a) Allocate sufficient resources and effort towards digitisation; and
- b) Effectively innovate and realise benefits from innovation.

The latter is particularly important. Health services are recognising that capitalising on new opportunities presented by technology requires development of explicit innovation practices. Innovation needs to be carefully designed and embedded – it is not a function of serendipity. Hospitals are continually refining their approaches to change and bring innovation out of the shadows and into the mainstream hospital practice.

These innovation practices are common to the three innovation projects featured in this paper. It distils the views of healthcare experts who have experience in the implementation of digital hospitals, not just their design. The paper is informed by the stories, reflections and insights from three organisations: Princess Alexandra Hospital, Box Hill Hospital and Bendigo Health (see profile of projects below). While these examples are on the transformative end of the innovation spectrum, the learnings are equally relevant to more incremental innovation projects.

	Princess Alexandra	Box Hill	Bendigo
Nature of the innovation project	Major, holistic digital transformation project	Deployment of discrete technologies as part of an ‘agile’ implementation	Foundation project focused on getting major technology pillars in place
Compelling event	Cerner implementation	Hospital build	Hospital build
Focus area	<ul style="list-style-type: none"> - Structured clinical notes - ED - Surgery and ED workflows - Pathology/radiology orders and results - Scheduling (outpatients and elective surgery) - Device integration - Closed loop observations - Managing deteriorating patient’s workflow - Positive person identification 	Range of specific technologies implemented	<ul style="list-style-type: none"> - EMR - UC - Mobility - Infrastructure
Hospital profile	<ul style="list-style-type: none"> - 1033 beds - 6,529 staff - Service 1.1M 	<ul style="list-style-type: none"> - Revenue \$880M - 9,604 staff - Service 750,000 	New hospital

Figure 1: Profile of three digital hospital projects

The paper distills eight major lessons that can help providers make more informed design and implementation decisions, including specific examples from three successful digital hospital projects.

Eight lessons about innovation and digital hospital design

A major theme of the conference summit was the need for health providers to move beyond talk and towards action. The lessons cover three dimensions of Digital Hospital Design and Implementation: What, How and Who. The alignment of the lessons to these dimensions are summarised in Figure 2.



Figure 2: Aligning lessons to the what, how and who dimensions

Lesson 1: A digital hospital is based on a transformation mindset

Investment in leading edge ICT does not necessarily equate to a digital hospital. While the effective use of ICT is essential to become a digital hospital, it is not sufficient. You don't buy your way to becoming a digital hospital.

"Planning a digital hospital is not just about infrastructure and technology, success is based on investing in organisation change and clinical leadership that support transforming clinical service delivery."

Michael Draheim, Princess Alexandra Hospital

A true digital hospital is one which effectively aligns hospital infrastructure, people, process, knowledge and ICT. It considers digital a source of organisation-wide transformation, not just a discrete tool or piece of equipment. The example of pagers for clinicians was raised as a test of whether an organisation was truly committed to digital transformation. While 'analogue' pagers have been widely used by clinicians it was shown that this tool could not effectively integrate into a digital hospital seamlessly. In a digital hospital, clinicians will need access to tools that serve multiple functions, can scale and interact with other digital systems in the hospital.

*“Don't try to integrate legacy technologies like pagers into the digital hospital.
We tried and it doesn't get the results..”*

Zoltan Kokai – Box Hill Hospital

The point about pagers was more than a comment on a specific technology. The real point was that a hospital's commitment to digitisation needs to be comprehensive, as well as sustained. Allowing for exceptions for recognised good practice undermines the entire agenda.

“You might as well impact the whole hospital as quickly as possible... rather than stretching it out over weeks and weeks and weeks and years and years and years.”

Michael Draheim, Princess Alexandra Hospital

Lesson 2: Digital hospital implementation is a clinical change – not an ICT project

Digitisation of a hospital needs to be thought of as core organisational business. Strong and highly visible executive and clinical leadership is a prerequisite, not a nice to have. Failure to secure appropriate clinical sponsorship before implementation should be treated as a red flag. Clinical buy-in extends beyond the engagement of a prominent clinical sponsor. The project needs to have the broad support of clinicians, and requires investment in getting clinical directors on the change journey first to send clear signals to the wider organisation. The primacy of clinical buy-in also needs to permeate formal governance structures. The emerging role of Chief Medical Information Officer is an example of how organisational structures and accountabilities are changing to ensure greater clinical buy-in to critical decisions.

Lesson 3: Patient safety and service continuity is paramount

Minimising disruption to services and ensuring patient safety needs to have primacy in any digital transformation. These are difficult to achieve particularly in large scale projects, the approach at PAH was 'agile big bang', a full stack of capability implemented over a few weeks that aligned with the models of clinical service delivery and work was lead and owned by the clinical leadership of the Hospital.

While disruption cannot always be prevented, the focus of hospitals participating in digital transformation programs is to minimise the impact of disruption, particularly in relation to patient safety. At Princess Alexandra the goal was to have no major impacts on services, but it was anticipated that a disruption due to the significant organisation change was almost 'unavoidable'. Princess Alexandra Hospital created a comprehensive clinical safety watch program which saw an independent part of the patient safety unit appointed to observe and monitor risks associated with clinical harm. The monitoring program included the appointment of 'floor walkers', people sitting within the command centre and conducting investigations as they related to potential or real patient issues. The independent nature of this group was critical to ensure that the broader organisation was confident that things were done in the right way, but also demonstrated to clinical stakeholders that the project was being approached with clinical not project goals in mind. The end result at Princess Alexandra was zero patient harm associated with the project implementation.

Lesson 4: Simulated workflows are critical in de-risking implementation

The anxiety of 'go live' can be vastly reduced by investing in simulated workflows. By focusing on the workflows that are most commonly used – as well as those that are impacted most significantly – hospitals are able to better understand clinicians' likely experience with the changes. At Princess Alexandra Hospital, 103 workflow 'rehearsals' were conducted with clinical and non-clinical staff. This included utilisation of doctors or nurses to act as 'patients' as part of the simulations to ensure that they modeled the processes from a range of perspectives. The rehearsals were incredibly valuable in terms of generating insights about people's interactions with the workflows and to instill confidence among those most affected.

Training is also critical to effective transformation. Specific learnings from the digital health design conference included:

- Using a range of learning models as part of training maximises the chances of success.
- People learn at vastly different speeds. To illustrate, one hospital found that doctors typically required about four hours training, though some finished in as little as two hours and others required the full allocated time.

Lesson 5: A clear view of benefits underpins the digital hospital business case

The transition to a digital hospital represents a fundamental shift. It is likely to involve significant time, resources, executive focus and political capital. The business case for a digital hospital roadmap and implementation will therefore need to be robust, particularly in relation to benefits. The assessment of benefits needs to account for quantitative benefits (productivity savings, costs avoided) but increasingly need to be weighted towards intangibles. As an example, a discrete digital hospital initiative might not save costs directly but has the potential to generate changes in work practices that have enormous value (e.g. improving patient safety). A robust benefits assessment needs to ensure both types of benefits are accounted for and weighted.

A number of specific lessons in relation to the business case process were conveyed:

- The business case needs to do more than identify benefits – it needs to instill confidence that those benefits will be realised. There is no room for 'theoretical' benefits in a business case – to be accurate those benefits need to be realisable
- The business case approval process is complex and time consuming. The business case approval process took six months for Bendigo Hospital – far longer than had been estimated
- A business case needs to clearly articulate downstream risks. For example, adoption of new cloud services poses financial risks arising from the transfer from capital to operating models (particularly when major hospital upgrades tend to be funded as capital projects)

Lesson 6: Invest in getting real time information to clinicians

Change management is too often thought about as a static process. But to truly effect change requires the capacity to listen (at scale) and respond to new information. It also means providing as much information as possible to those most affected by the change. Princess Alexandra hospital had to respond to 12,000 calls during the 8-week 'go live' period of its digital transformation process. The challenge was ensuring there was enough 'coverage' to support the whole hospital 24/7.

“The challenge was ensuring that we had the right people in the right place at the right time. By spreading out our change champions and clinical support team throughout the hospital we were able to deal with these 12000 calls and achieved around about a 95% closure rate within the day of those calls coming through.”

Michael Draheim, Princess Alexandra Hospital

One of the common learnings from all three projects is not to understate the resourcing requirements associated with change. The sheer scale of change expenditure came into sharp focus as part of some interactions between Bendigo hospital and Google. The Bendigo hospital re-development budget was approximately \$650M for construction, and change management received only \$3M. Despite the comparatively small change management budget, Bendigo Hospital leverage the fund by ensuring that all business unit managers were trained to be change agents, creating a network of 120 change managers and 150 super users across the organisation.

Lesson 7: Get the underlying infrastructure right

Digital hospital design projects tend to be oriented towards applications and interactions with users. As a consequence, hospitals reported that it was easy to underestimate the importance of underlying infrastructure including basic connectivity (coverage and density), data centre, redundant networks and security. A common reason for failed implementations is not the failure of software or applications on ‘go live’ but the inability of the underlying infrastructure and network to support additional load¹.

The Bendigo Hospital project focused on four major pillars: electronic medical records, unified communications, mobility and infrastructure. There were a number of reasons for tackling all of these simultaneously rather than prioritising EMR first:

- Much of the risk comes from integration and it makes sense to do the integration once (and properly). This is particularly true in relation to an issue such as identity which underpins the move to a digital hospital.
- The risk that business expectations would not be met if the underlying infrastructure didn't support the new EMR functionality.
- The change management process can include information about infrastructure that's relevant to users, including providing good news about likely improvements in infrastructure performance.

“Data Centres were important 10 years ago, they were important 20 years ago and they are still important now”

Zoltan Kokai – Box Hill Hospital (Eastern Health)²

Another major infrastructure consideration relates to data and security which are attracting more focus from an ICT governance perspective. Hospitals need to be able to answer questions related to where data is stored, how it's used and how it is protected.

¹ Source: Brad Davies, dandolo partners, *Challenges in Managing Digitisation and Innovation in Hospitals*, 2016

² Source: McDonald K, Pulse IT, *Eastern Health aims for HIMSS stage 6 at Box Hill Hospital*, 17 August 2016

Lesson 8: Be creative with communication to achieve cut through

Clinicians are time poor and are exposed to a significant amount of information. To achieve cut-through communications related to an innovation, projects need to be creatively designed and personally relevant. Communication needs to demonstrate how specific jobs would change, not just how the processes and workflows would change. Experienced change managers quickly realise that placing an article in the staff newsletter is unlikely to shift mindsets or behaviours in the same way something more personalised might achieve.

Communication extends beyond internal staff to the broader community. Privacy tends to be a particularly strong concern among members of the community and patients in relation to digital transformation. Common questions include whether their information will be made available on Facebook or YouTube, as well as wanting to know more about what the hospital is trying to achieve. In some circumstances providers may have to share more information than they expected to in the spirit of transparency.

Conclusion

The examination of three separate digital hospital projects demonstrates that there is agreed good practice regardless of the profile or focus of the project. Three issues emerged as prerequisites for success:

1. Major investments in and a sophisticated approach to change management are critical. Clinical leadership, not just clinical buy-in, is a prerequisite for success particularly in large scale implementations
2. Benefits need to be clearly understood if they are to be realised. While there will generally be unintended consequences a clear view of intended benefits needs to be established early so that the realisation can be planned for
3. The underlying infrastructure needs to be robust and scalable. Gaps in the infrastructure platform are a common source of failure for initial implementations.