Cisco Live 2017

Healthcare Innovation Roundtable Discussion

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Health Innovation Session: Cisco Live 2017

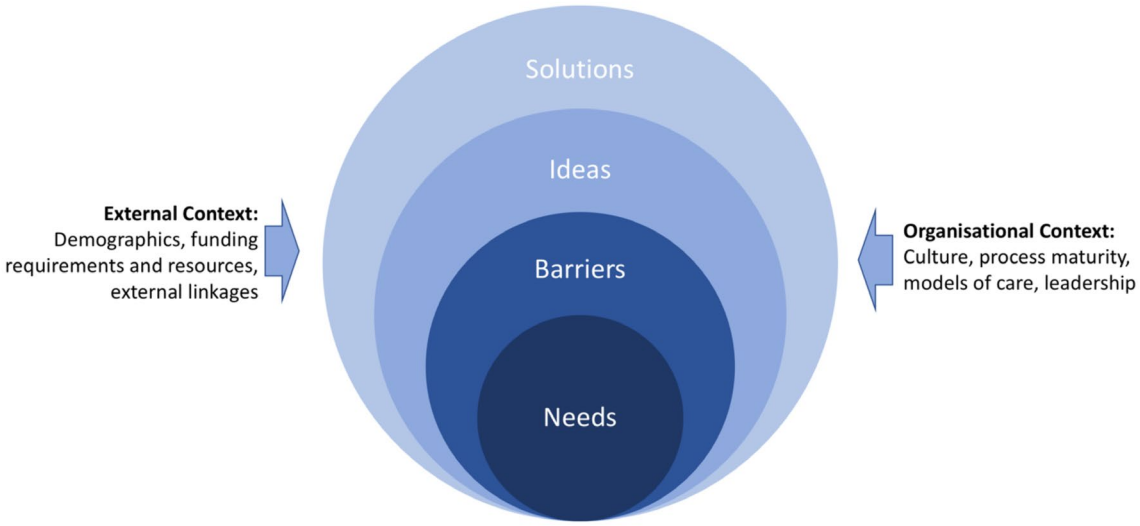
THE HEADLINES

- Healthcare is increasingly challenged by constrained budgets, rising expectations and growing complexity of care. Innovation is a critical lever to drive improvements to healthcare.
- Innovation models need to be tailored to the specific organisational and broader context.
- While there are numerous innovation models, all share a common set of underlying requirements including access to information and the capacity to distil needs, barriers, ideas and solutions.
- One of the most fundamental challenges in hospital innovation relates to poor coupling between clinical process innovation and information technology innovation. This causes inefficiency and risk.
- Clarity about the role and status of digital information infrastructure is fundamental in improving innovation. The infrastructure maturity model is a tool for diagnosing and improving this.
- There is interest in creating a community and collaboration around this subject – anchored by an emergent dataset (aggregated results of the IMM) and using a new co-creation platform.

Innovation models need to be context specific but share a set of underlying requirements

Numerous innovation models exist in healthcare globally. While there is a broad diversity of models, they generally have a common focus of accelerating the advancement of the healthcare organisation through delivering one or a combination of the following objectives: improved quality (including patient/staff experience), safety or efficiency. Different models are driven by the people centred nature of the innovation process and its need to reflect both the organisational context of the facility (culture, processes and leadership) as well as its external context (demographics, funding and community expectations). For example, while a hack or sprint might address one hospital's specific needs it may be ineffective for another.

Figure 1: Relationship between context and innovation domains



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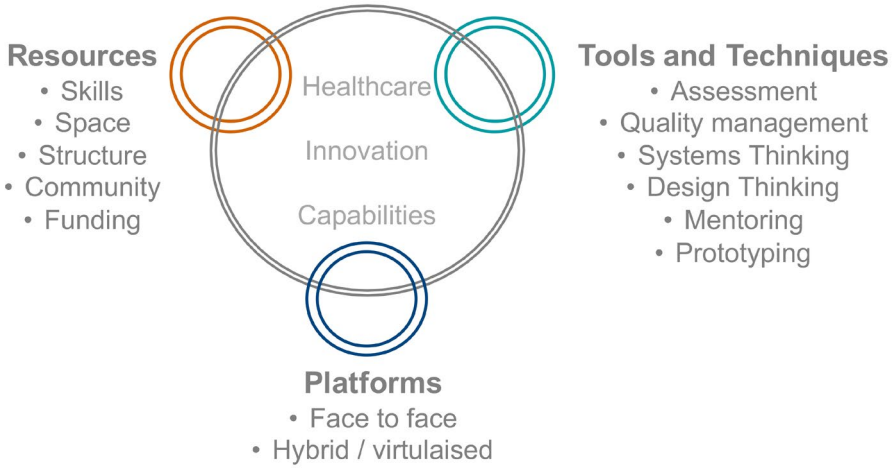
The recent Cisco Study tour of leading US healthcare innovation programs (Mass General, MIT, Pulse@Challenge, IHI, Johns Hopkins and UNC) highlighted this diversity of innovation models. While customised in their delivery, these models were comprised of a fairly uniform set of capabilities that were uniquely assembled to fit in with the facility's cultural and operational requirements. The key capabilities can be grouped according to their deliverables: Resources, Tools/Techniques and Platforms.

Figure 2: Key Capabilities Contained within Healthcare Innovation Models



RESOURCES

- **Skills:** Identifying and filling skill gaps of individuals or teams
- **Space:** Areas to gather and exchange information and experiences (real or virtual)
- **Structure:** Programs that guide teams in the development and delivery of ideas
- **Community:** Creating and sustaining a community of contributors, allies and friends to spark ideas and create a sense of belonging.
- **Funding:** Providing exposure to funding sources and the opportunities to pitch for support

TOOLS AND TECHNIQUES

- **Assessment:** Analysing and priotising tasks, ideas and objectives
- **Quality Management:** Understanding and improving process and workflow
- **Systems Thinking:** Optimising the impact of change on the complex healthcare system
- **Design Thinking:** Improving the way teams and individuals interact with systems/each other
- **Mentoring:** Leveraging the skills of the experienced to support the novice
- **Prototyping:** Creating proof points for critical ideas

PLATFORMS

- **Face to Face:** Optimising face to face interactions, sequencing of community/team events
- **Hybrid/Virtualised:** Creating ability for asynchronous and remote participation in the teams and innovation communities

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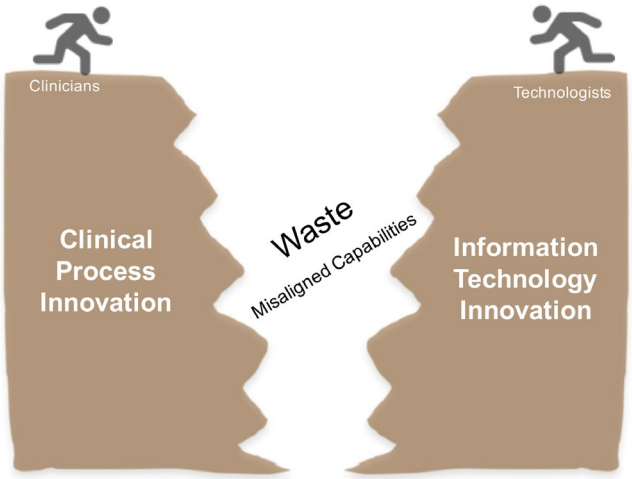
A fundamental challenge in hospitals is coupling clinical and technology innovation

There has been a developing conversation emerging from the study tour stemming from the observation of the often poor coupling between clinical process innovation and information technology innovation in many hospitals. This “innovation gap” can be a significant impediment to accelerating innovation in hospitals and better leveraging their existing process improvement programs. These coupling issues manifest themselves both in large scale systems and facility deployments, but also on the microscale in how hospitals evolve their processes on a day to day basis. There are a range of potential explanations for these issues, including cultural variances between clinical and technology professionals, alignment of incentives and the quality of interdisciplinary communication process.

Figure 3: The innovation gap in healthcare



The net effect of poor coupling is inefficiency and risk. Specifically, uncoupled innovation and technology processes can lead to:

- Imbedded clinical application/EMR inefficiencies
- Poor new hospital performance delivery
- Underutilised technology investments (slow ROI)
- Uncoordinated technology investments (low ROI)

None of the above are acceptable for a contemporary hospital.

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Despite differences, innovation models share a set of underlying requirements

The study tour – and subsequent roundtable discussion at Cisco Live – demonstrated that it is critical to focus on what's common as well as what's different when examining innovation models and ways to improve the coupling of innovation and information technology innovation.

Discussions in Australia and the US revealed, among other things, that while there is diversity in the innovation models being deployed, there are a common set of underlying requirements to fuel successful change. These requirements fell into four broad categories:

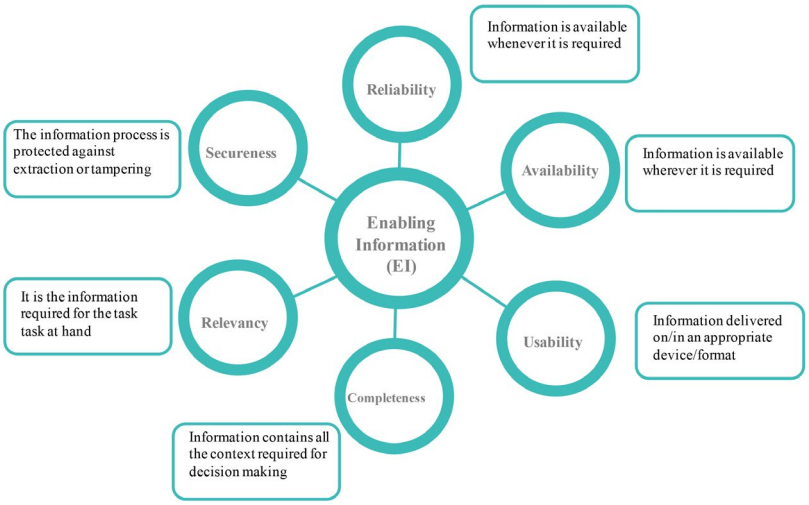
1. **Place (physical and virtual)**: the need to establish an appropriate environment for innovation
2. **Internal capability (clinical, technical, organisational)**: this includes the capacity to sustainably build skillsets that are required to design and implement change
3. **Collaboration mechanisms**: this includes linkages with industry and access to external capability which is required to overcome barriers, generate ideas and develop solutions
4. **Digital information infrastructure**: the extent to which an organisation's information technology and processes are capable of meeting current and future needs

Item (4) above – **digital information infrastructure** – is one of the least discussed and potentially most important. It is important for the following reasons; a) information is a powerful enabler of innovation, b) information infrastructure gathers, shapes and delivers information and c) there is now a language, the Information Maturity Model (see discussion later in this paper), that can be applied to characterise and enable the evolution of the information infrastructure.

Central to the Infrastructure Maturity Model is the concept of the hospital information infrastructure being responsible for delivering the enabling characteristics of hospital information. That is how effective a hospital's information is at supporting and driving innovation. There are 6 characteristics of Enabling Information

- **Reliability** – is information available when it is required?
- **Availability** – is it available wherever it is needed?
- **Usability** – is information delivered on/in an appropriate device/format?
- **Completeness** – does information contain the context for decision-making?
- **Relevancy** – is information required to complete the task at hand?
- **Secureness** – is data protected against extraction or tampering?

Figure 4: Characteristics of 'enabling information'



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A PROCESS NOW EXISTS FOR ACCURATELY CHARACTERISING DIGITAL INFORMATION INFRASTRUCTURE IN HEALTHCARE AND GUIDE ITS EVOLUTION.

Cisco's Infrastructure Maturity Model (IMM) represents a major step forward in better understanding a hospital's underlying information, and consequently its innovation capability. The IMM captures the information services structure of a facility, based on an 8-level model and analyses how mature a hospital is in terms of capturing, accessing, disseminating and generating insights from information. It enables an institution to understand how prepared it is to support planned application and infrastructure deployments, including how effectively it creates resilience in the facility and allows it to effectively respond to changing demands.

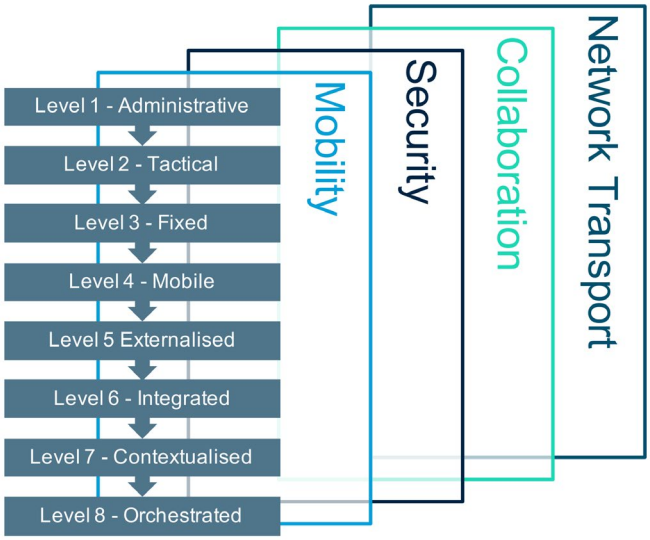
The model has eight levels of maturity – from Level 1 'Administrative functionality' to Level 8 'Orchestrated functionality'. The levels provide a detailed framework for identifying the current state of the information infrastructure, and the potential information services gaps to meet the future operational and clinical objectives. The model is also mapped to the HIMSS EMRAM assessment, providing a mechanism for hospitals that are on a journey of EMR improvement to ensure that they are fully capable to support their clinical application objectives.

To achieve sufficient granularity the model is broken down into five technology domains. These domains are increasingly recognised as the cornerstones of a hospital's information technology infrastructure:

- Wireless and mobility
- Security
- Unified communications and collaboration
- Network transport
- Datacentre

> *"Information is a powerful enabler of discovery, process change and process management. But it is often the underlying infrastructure that gathers, shapes and delivers information."*
>
> – Brendan Lovelock, Cisco

Figure 5: Levels and domains of digital information infrastructure



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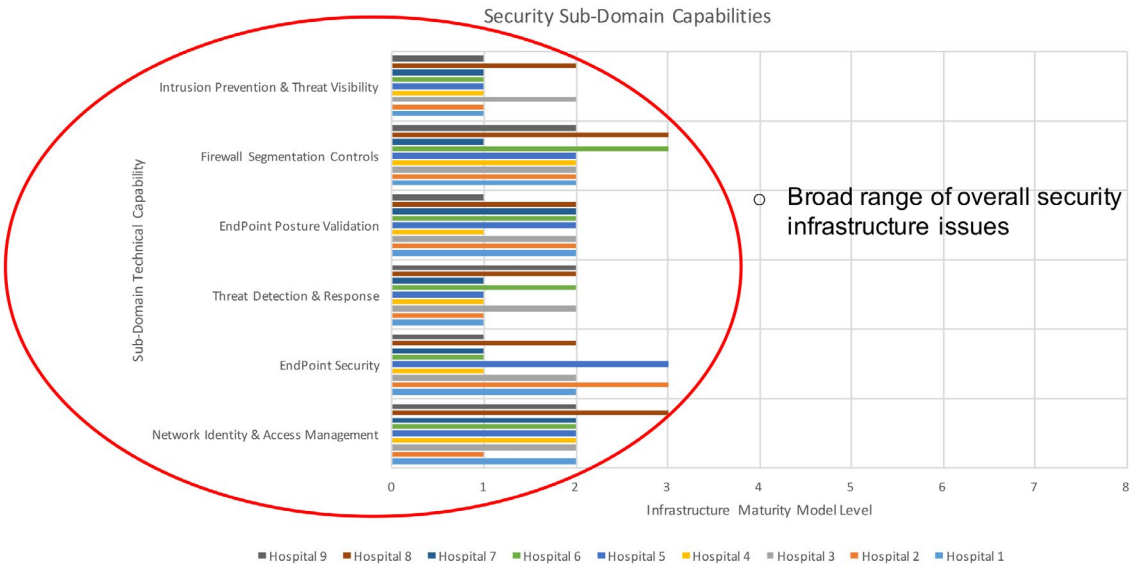
EARLY RESULTS FROM THE IMM REVEAL SIGNIFICANT ROOM FOR IMPROVEMENT IN AUSTRALIAN HOSPITALS

Ten separate IMM reviews have been completed in Australia, creating insights for individual hospitals but also for the broader community in terms of patterns and trends. A number of conclusions can be drawn from the initial assessments:

- Australian hospitals are reasonably immature in terms of their digital information infrastructure, sitting collectively between Level 2 'Tactical' and Level 3 'Fixed'. Hospitals at this level generally have a high number of paper-based processes (for ordering, reporting and accessing data) and limitations in wireless data capability
- Hospitals are not well prepared for mobile capability despite it being on most hospital's technology roadmaps
- The domain where hospitals are universally weak is security. In a large number of cases hospitals rate as Level 1 in many of the key security services at the infrastructure layer. This is particularly concerning given the focus this issue has at Board and senior executive layers. These de-identified findings are provided in Figure 6.

Figure 6: Detailed findings for IMM security domain



An opportunity exists to expand use of the IMM across Australia, providing benefits to participating hospitals, as well as the sector more broadly which will have greater insight into trends and benchmarks.

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Opportunity to create a sustainable community around innovation and information enablers

There was a strong desire for those at the session to maintain the conversation, and to make it more practical and specific. To do so would require two elements:

1. AN ANCHOR DATASET AND THEME

One specific opportunity is to ensure that the community has access to de-identified, aggregate information that is captured as part of the IMM reviews. As more hospitals are added this dataset will become more robust and the methodology more refined. This information could also be used to inform policy makers and funders, including for example the observation that most Australian hospitals that have participated in the IMM score poorly on cyber security resilience.

2. A MECHANISM TO ENGAGE THE COMMUNITY

It was acknowledged that in many cases hospitals find it easier to partner with institutions overseas than those in their vicinity. However, if hospitals are to unlock new value through collaboration and innovation they will need to get better at working together through inter-disciplinary teams and cross-industry arrangements. Cisco is contributing to improving this capability by partnering in the development of an online co-creation platform (thoughtlane) to enable these capabilities. In support of this platform Cisco has created an ANZ innovation collaboration site (www.agilehospital.org) focused on building a broader community for sharing innovation knowledge and building a stronger healthcare innovation community across Australia and New Zealand.

These efforts are in their early release stages and will build functionality as they evolve. Go to the Agile Hospital site (www.agilehospital.org) to follow the development of these capabilities and involve yourselves in the healthcare innovation discussion.

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