Designing the hospital to meet IT needs

The traditional design concept of the physical healthcare facilities is undergoing a fundamental change as the cyberspace or virtual world assumes increasing technical importance in healthcare. Steven Tipper says greater design considerations are required to meet these future needs.

Steve Tipper

Future demographics

Australia is faced in the foreseeable future with an ageing population, rapidly increasing costs of health (both direct medical and support) services and increasing political concerns that the healthcare system is failing consumers.

As a result, there is a growing expectation that healthcare facilities design will be evidence-based and support adaptable and flexible facility use. These 'future-proofing' principles of adaptability in design and flexibility in use are important for humanising the hospital environment, as Jane Carthey demonstated in her article: "Humanising the hospital environment" (*Hospital&healthcare*Dec 05/Jan06).

Past patterns

Most of the major teaching hospitals in Australia are proud to display their past architectural heritage as symbolic stability while staying at the forefront of 'modern care'. This has given rise to description of these hospitals as "cathedrals to modern technology and modern science" (Woolridge 1997).

Over the latter half of the 20th Century all of the operational activities within healthcare facilities have occurred. Significant rebuilding and refurbishment has occurred matched by the invention and diffusion of new medical, information and communication technologies (MICT).

Present reform

A large part of the cost of healthcare (36 per cent) is being driven by medical technology, according to a recent Australian Productivity Commission Report. While there has been a clinical trend towards specialisation, there is also a clear trend of convergence of medical, information and communication technologies to support that specialisation.

This is best exemplified in the fixed telephone line used as a voice communication tool that persists while additional communication technologies have been added, such as mobile telephony and video-capture over digital broadband. An example of the development of patient information portals is www.or-live.com which "provides visitors to the site with referrals

RIGHT: Future medical records system: allows clinical staff direct access to records and offers flexibility.

to medical facilities and health care providers that may be able to assist them in their medical needs". Clearly there are significant internal fitout and furnishings issues in 'going live' with such technology.

The Future: information age

There is evidence that by controlling technology and designing with it, children think differently than we do now (Harel 1999) and we should expect that they will want to continue their 'normal' immersion in the cyberworld of telecommunications and social connectivity while visiting healthcare facilities.

The rise of consumerism in healthcare is a social marker for 'information-age healthcare' (typified by individual self-care, self-help networks, professionals as advisors and at the highest cost level as authoritative providers supporting self-care). As a result it has been editorialised in the British Medical Journal that "Information technology and consumerism will transform health care worldwide" (Smith 1997).

Medical records: past, present and future

There is a wealth of information on healthcare issues for the 21st century, however a recent review has identified some of the key health IT trends. Each trend has significant potential impact on healthcare as we know it. These nine trends identified by leading international health informaticians are the use of barcoding and active radio frequency identification (RFID); Disease Management; Electronic Health Record; Emergency Preparedness; Integrating PACS; IT and Biomedical Devices; Patient-Centric Portals; Regional Networks; and Telehealth (Healthcare Informatics 2005).

The major MICT issues facing facility designers can be identified using medical records as an example of the convergence of medical, information and communication technologies.

The past was typified by hardcopy files, of massive weight, requiring a basement location, accumulating in storage space usage over time and mostly accessible to medical records staff with spaces for clinical staff to write-up/research.

The present is the acceptance of change in work practices and integration of the computer for real-time records (combined hardcopy and electronic histories) requiring electrical connection, data cabling and desk space for PC, keyboard, screen plus hardcopy files which still need space.

The 'future' is electronic (virtual space) records, which minimise hardcopy paperwork, allow clinical staff direct access to records and have some flexibility in use, for example mobile trolleys with wireless PC connectivity supporting staff e-mail etc via an intranet.

There is valuable experience in Australia and New Zealand with new medical information and communication technologies and changing structural and functional arrangements. These offer opportunities for evaluation and progressive feedback-improvement of the healthcare system and particularly physical facilities design planning.

Considerations

The architect of future healthcare facilities will be required to design, plan and manage construction of physical space and include consideration of the virtual interactive space that is becoming part of the models of care influencing healthcare facilities design and services delivery.

Consideration of flexibility, adaptability and specialisation in planning of the physical space within healthcare facilities at the initial design stage will need to be reviewed throughout the useful life of the facility.

New evidence-based research is needed to understand healthcare facility design and operational outcomes arising from interactions in the physical world and cyberspace.

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ABOVE: Past medical record system: hardcopy files and storage problems.

ABOVE: Present medical records system: integration of the computer for real-time records.