ENABLING modern healthcare

The role of IT in raising productivity, improving outcomes and supporting patient-centric services.
Introduction

The healthcare industry faces huge challenges, with a wide range of ever increasing demands. Health services are under pressure to provide ever better service to an ever higher number of patients – often with fewer resources.

In other industries, information technology has helped raise productivity and enable change, and is now a part of daily work. In healthcare, however, while IT is widely used, it has arguably not yet made as big an impact as it could have.

Some of this is attributable to the innate caution in healthcare – a sensible trait. The challenge for IT has to be to demonstrate value in practical terms acceptable to healthcare.

Improved patient safety and better quality of care from using health informatics has compelling evidence. Healthcare IT supports team-working, ensures the delivery of information to assist diagnosis, identifies potential drug interactions and allergies, and maintains consistent, secure and shared electronic patient records.

This paper looks at the trends in healthcare and sets out some of the areas where IT is supporting the provision of better, more efficient health services.

It also sets out Fujitsu’s involvement in, and global experience of, healthcare. Particularly important is our Japanese heritage, which informs our absolute commitment to quality and delivery, and a rational approach that, like healthcare, looks to the long-term.

Fujitsu’s realistic culture drives our customer focus. We try to understand issues in detail, from policy to the needs of individual organisations and users. We also believe that we can only learn from our customers.
Healthcare today faces a range of significant challenges in the continual delivery of care that is effective, relevant and efficient.

RISING HEALTHCARE COSTS

Changing demographics mean that in many countries an increasing number of retirees are being supported by fewer workers. By 2014, for example, 25% of the Japanese population will be aged over 65.1 For public services in many countries, the prospect of fewer tax payers and an older population requiring more social benefits and healthcare is a major concern.

Health issues resulting from an aging population are a product of both increased life expectancy and declining birth rates. As birth rates fall, both healthcare funding and demand change. Initially, working-age adults have fewer young dependents to support and so use the health system less. Over time, however, old-age dependency rises. Coupled with the increase in longevity, the long-run effect of these demographic shifts is an increase in total dependency.2

But rising healthcare costs are not all age-related. There is also a huge rise in chronic disease across more age groups and countries. In 2005, for example, chronic disease caused 60% of the 58 million total reported global annual deaths.3

Many chronic diseases were traditionally regarded as diseases of the rich, developed world.4 Increased modernisation of the developing world results in lifestyle-related chronic diseases afflicting an increasing number of people, families and communities and threatening to hinder development in many countries. The World Health Organisation reports that 80% of chronic disease deaths now occur in low and middle income countries, with men and women equally affected. Increased national and family income may not necessarily lead to better health – the benefits of increased access to clean water and modern medicine are offset by dietary and smoking-related illness.

The evidence is that chronic illness does not just afflict the affluent and elderly. It will place a new burden on the healthcare industry with long-term conditions, draining budgets with prolonged treatment. The US Surgeon General has said that 75 cents in every $1 spent on healthcare is to treat chronic disease.5 Health systems face a double burden of chronic and acute conditions and chronic diseases are the most complex.6

---

2 Euromod G Verbiest 2004 Tax Treatment of Replacement Incomes
3 World Health Organisation 2006 ‘Preventing chronic diseases: a vital investment’
5 American Medical Association JAMA June 2004 Vol 291/21
6 American Medical Association JAMA June 2004 Vol 291/21
INCREASED PATIENT EXPECTATIONS

Citizens’ expectations of healthcare have risen – particularly its ability to use technology to save life, increase comfort and extend life expectancy.

Meanwhile the maturing of communications channels – media, call centres and the internet – conditions many people to expect 24-hour access to services and information.

And, because businesses deliver more flexible, multi-channel services to consumers, people increasingly demand similar levels of service and innovation from their healthcare providers.

Healthcare systems are always changing – management and clinicians are expert in responding to new clinical demands but now must manage their own revolution in provision using technology.

For healthcare providers, these raised expectations present a significant challenge.

GLOBAL CAUSES OF DEATH


<table>
<thead>
<tr>
<th>Category</th>
<th>% of Total Chronic Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular disease (heart, stroke)</td>
<td>61%</td>
</tr>
<tr>
<td>Cancers</td>
<td>15%</td>
</tr>
<tr>
<td>Chronic respiratory</td>
<td>5%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>3%</td>
</tr>
<tr>
<td>Other chronic diseases</td>
<td>5%</td>
</tr>
<tr>
<td>Communicable diseases, maternal and perinatal conditions and nutritional deficiencies</td>
<td>10%</td>
</tr>
<tr>
<td>Injuries</td>
<td>0%</td>
</tr>
</tbody>
</table>

Total chronic disease 61%
RESOURCES LIMITATIONS

Getting staffing right is a constant challenge. Making sure skills are available locally is helped by basic records and planning. Specially trained health professionals are, however, a scarce resource in most countries. Competition for health professionals has become global.

In many countries, healthcare providers are seeing falling numbers entering training, more professionals retiring, and extended training periods for specialist skills. In response, they increasingly follow commercial practices by making better use of skilled staff through labour saving investments in handling information – for example, through consistent record keeping, better communications, electronic document management and decision support.

EMERGENCY MANAGEMENT RESPONSE

Health services need to prepare for a range of short-term medical emergencies whose frequency and severity is difficult to predict accurately.

Today’s globalised world demands a fast response to rapidly-spreading communicable illnesses, like SARS, influenza, measles, meningitis, cholera, diphtheria, yellow fever and tuberculosis, which can be huge burdens on healthcare.

And despite better modelling techniques natural disasters, extreme weather conditions and armed conflicts also pose challenges for healthcare planning.

LONG-TERM INVESTMENT

While healthcare structures do vary globally, the service model involving primary care services, general hospitals and more specialist hospital care remains the most common.

Extra money alone is never enough. Budgetary pressures and demands for increased accountability do promote a management focus on balancing the books and hitting targets. Without good information about trends and opportunities, provision can become unbalanced.

Where healthcare providers and health authorities invest in upgrading services, ideally they want to demonstrate a direct improvement in health outcomes. This requires ways to link spending plans to the impact on patients and staff with benefits being expressed through patient outcomes, safety, increased productive time, and support for clinical research.
MODERNISING INFORMATION SYSTEMS

Government led ‘eHealth’ strategy and investments to update healthcare IT systems are now found in almost all developed and developing countries. The NHS in England, for example, is in the midst of a long-term programme to adopt almost completely electronic health records management. This includes integrated systems linking primary and secondary care, new systems in clinical departments such as digital imaging, support for community care, plus large scale decision support and resource scheduling investments.

Similar projects to build the long-term personal electronic health record accessible throughout the health system are in progress across the world. These projects promise enormous productivity gains and patient safety benefits. As a result, it is a time of great transition for healthcare professionals – opportunities, new tasks and professional challenges are all in evidence.

Summarising the various demands on healthcare, Jeff Smoot, National Director Health Solutions, Fujitsu Australia & New Zealand, comments:

“Health funding is under pressure and long-term care and chronic disease care will take an ever-increasing slice of the budget. The increased pace of change in healthcare challenges both providers and professionals, and I am concerned that the focus on preventative medicine and chronic disease management may only shift the cost from one service to another without any real savings.”

“Individual care now comes from many different services in different locations and settings. IT solutions must be based on specific strategies around communication, collaboration and monitoring that are patient-centric.”

“Customers will achieve the efficiency gains required for sustainable health delivery by investing in linking professionals and presenting one patient record. We risk seriously lagging behind patient and citizen expectations – they will continue to escalate health as a serious political issue.”

“We risk seriously lagging behind patient and citizen expectations – they will continue to escalate health as a serious political issue.”

Jeff Smoot – National Director Health Solutions, Fujitsu Australia and New Zealand
CHAPTER 2:
What will healthcare in the future look like?

By its nature healthcare is conservative, demanding solid evidence of effectiveness before innovations are adopted.

The UK Audit Commission estimated that without IT systems, clinicians spend 28% of their time seeking information concerning patient records, letters, X-rays and test results. While this may seem like a clear opportunity for IT, even an apparently routine project with robust technology such as electronic document management takes on new dimensions when an error might affect confidence, patient care and clinical outcomes.

IT providers must show responsive solutions for healthcare that maintain clinical outcomes whilst also addressing health professional aims of quality of care, accessibility, traceability, integrity, confidentiality, increased throughput, and lower costs.

Going forward, it seems clear that IT needs to support the two main strands of integrated care: the move to a more joined-up vision of care provision and the simultaneous need to tailor care to individuals based on a holistic view of their needs.

The ideal electronic health record will be broad enough to span all locations of care; that is it must be accessible from any situation in which the individual requires healthcare. It should be deep enough to include information ranging from lifestyle data to biodata such as genomic profiling. Finally, the record needs to be comprehensive for a lifetime, including all the clinical events impacting on a person’s health.

INTEGRATED CARE – IN PRACTICE
To understand the size of the task in connecting up systems to improve patient care, imagine the case of a stroke patient.

A 57 year old man has a stroke. He leads an active life and has a well-paying job that supports his family, including two children who are at university.

As he lies on the floor, numb and trembling, waiting for help, he tries to imagine what his life will be like in future. Will he ever regain his quality of life?

To succeed he's going to need the services of many people in many organisations:
- He'll need care in a specialist stroke unit – and other illnesses may be found that need attention.
- His GP will need to share his medical care and his health record with the local hospital.
- He'll need community nurses, physio- and occupational therapists to assess his needs and compile a care package that might include special equipment and technology, changes to housing and longer term therapy at home.
- His family may provide care and may need assistance – and their financial affairs may change along with major life changes such as moving house, seeking social security, or having to pay for some care services.

All the health and social care agencies involved will need to share information and act in concert.

INTEGRATED CARE: BROAD, DEEP AND LONGITUDINAL HEALTH RECORDS
CHANGES IN DELIVERY METHODS

IT systems have traditionally mimicked organisational and funding boundaries, with separate systems for primary care, hospitals and their departments, community and social care. Health services, local government, mutual societies and private providers may all play a part.

This approach is evolving to a more patient-centred focus with professionals sharing the same record, and some participation by the patient in maintaining the electronic health record.

Some countries have now installed regional networks with shared systems for health and local government organisations. Secure internet access is often available to patients.

The implications of decoupling selected services from traditional care centres and creating patient centred care are huge. Treatment may be coordinated across multiple professionals in different places. No longer is a patient 'discharged'; instead a 'transfer of care' occurs.

Mobile healthcare and community care professionals need full access to systems. The patient will see technology used as a natural part of health provision – inside hospitals and clinics, and especially linking all services to support integrated healthcare and social services for those needing long-term or home-based care.

And the trend to encourage more democratic participation in designing health and social care will accelerate the ‘consumer influence’ already reinforced by internet searches and patient advocacy.

PROACTIVE INVOLVEMENT OF INDIVIDUALS

Presently, healthcare professionals often spend time dealing with patients who don’t actually require professional medical attention. Often they are seeking information that could be gained elsewhere.

Indeed, healthcare already addresses some aspects of this through electronic appointment booking and both official and unofficial web information. It’s a common occurrence, for example, for doctors to see patients arrive with pages of web information. How much better if, instead of leaving patients to using search engines, they were provided with useful, professional information and given clearer instructions about which part of the health system to contact?

The rapid rise of ‘self-service’ techniques in retail, finance and other industries suggests that, if introduced to healthcare, it will reduce costs, improve service, promote preventative medicine and empower patients.
CHAPTER 3:
How is IT helping to meet these healthcare challenges?

Encouragingly many healthcare providers already have good experience of large scale systems in clinical practice and administration. Indeed, many are now on third generation systems, making rapid progress in specialist areas such as order communications, electronic prescribing, and digitised patient records.

**VALUE-BASED THINKING**

With so many people and resources in the healthcare system both financial and service performance has to be managed, including outcomes, the costs of particular services and even individual patient treatment.

Better resource management has the potential to make great savings. Hospitals have increased operating theatre capacity or reduced queues by redesigning processes. Integrated processes reduce waste, avoid cross-infection, minimise downtime or prevent discontinuity between departments.

Value-based thinking focuses on designing effective health and administration processes that are measured by outcomes, and identifying the gradual improvements that remove duplication, avoid waste and produce continual incremental improvement.

**LEANER CLINIC PROCESS**

Waterside Medical Centre in Portsmouth, England is a primary care centre treating around 250 patients each day with routine general practitioner (primary care physician) and nurse appointments. An additional 100 patients are seen in a daily ‘walk-in’ clinic running in parallel. This is part of the policy to improve primary care and ease pressure on hospital emergency departments.

The clinic must meet National Health Service targets for appointments and treatment within time limits, but more importantly must also meet the needs of patients for accuracy of records and confidentiality. Whilst patients with appointments have a computer record at the clinic, the ‘walk-in’ patients may come from anywhere so often a new record must be created.

Instead of queuing to see a doctor in a consulting room, patients are brought into one of a series of identical treatment rooms. At one time GPs would see a patient and then update a computer record at a central triage station. This was time consuming and had the potential for error.

The practice engaged Fujitsu as part of process redesign. Now both GPs and nurses have a team approach to treating patients. The GP may complete a diagnosis and call on a nurse to complete a procedure. All are equipped with tablet PCs linked through a secure wireless network and now the team move from room to room to treat patients. Prescriptions are issued or authorised as required.

The gain from process redesign are seen as:
- Increasing the clinically productive time of professional staff.
- Streamlining treatment recording, especially of walk-in patients.
- Adherence to strict security requirements – not compromising patient confidentiality.
- Ease of use by all staff.
TECHNOLOGY-LED PROCESS IMPROVEMENT

Technology-led process improvement follows value based designs. Enterprise wide architectures moves departmental systems towards single databases, shared storage, common desktops, simplified network management, mobile working and a focus on a secure but shared electronic health record.

DECISION SUPPORT

Huge strides are being made in using IT to improve decision support. For example, the recently completed PACS (Picture Archiving and Communications System) project for the NHS in England\(^6\) stores images in high specification, secure data centres and replaces film based X-rays. This brings a host of benefits that go beyond simple efficiency improvements.

Integration across locations of care requires extensive skills in systems integration. The presentation of useful information in clinical records and from personal profiling requires sophisticated data analytics with user friendly information processing. The collection, storage and timely retrieval of large volumes of data implies effective datacentre management.

Map of Medicine is another initiative. Developed by clinicians, it is an online clinical information resource\(^7\) that takes clinicians through logical steps, from symptoms through to possible diagnosis and treatments. Map of Medicine currently includes information from 28 specialties organised over 370 care pathways.

Fujitsu deployed Map of Medicine for a wide clinical community in England as a web application. This means the most up-to-date version is available anywhere an authorised healthcare professional has access to a web browser.

DATA VISIBILITY, INTEGRITY AND INTEROPERABILITY

Traditionally healthcare providers installed systems focused on single departments or functions, such as maternity, emergency departments, theatres, pharmacies, laboratories, or surgery management. Admissions, transfers and discharges are handled by a patient administration system. Often systems use different patient identifiers, and may not integrate information.

The ideal model to update this architecture is a single real-time system with the same patient identity used across multiple clinical departments. Everything should be recorded – for example, allergies, laboratory requests and results, X-ray images, treatment details, prescription history, care plans and discharge notes. All records, order communications and changes must also have an audit trail.

---

\(^{6}\) NHS Connecting for Health: Fujitsu installed PACS in two years for 167 hospitals linked to a secure regional data centre for three Strategic Health Authorities.

\(^{7}\) Map of Medicine is ©Informa PLC
Such joined-up information is clinically valuable as team working increases and clinical pathways become more complex:

- An emergency department can see a patient’s medical history.
- If a pathologist can access GP prescriptions, they may be able to offer a more accurate diagnosis.
- A hospital diabetologist can ideally see the patient’s GP record.
- Drug allergy and interaction records can help avoid a life-threatening ‘adverse event’.
- Integration is valued by patients to support continuity of care in other settings such as local clinics and homecare.

Of course, this kind of joined up patient record requires considerable effort to ensure security, reliability and interoperability, along with transition plans to ensure that technical changes are made in a controlled way.

There are now multiple global and national standards which guide the development of electronic patient records.

**SECURITY AND PRIVACY**

With greater data sharing come the issues of privacy and security. For the first time, patients will need to make informed choices about how their data is used and by whom it can be accessed.

In the UK, healthcare organisations will introduce secure ‘electronic envelopes’ for patients and there are detailed rules specifying under what circumstances health professionals can access the care record. In Germany a health ‘smartcard’ will identify the patient, and in Finland patients will have a patient information portal.

**REDUCING ERROR**

Across healthcare, IT is used to improve patient safety. A good example is the General Hospital Universitario Gregorio Marañon in Madrid, Spain, which has had real success in drug safety by using a Radio Frequency Identification (RFID) to link patients, medications, and confirm drug administration. Maria Sanjurjo, Chief Pharmacist said: “We have seen a 90% reduction in medication mistakes. This project will undoubtedly save lives.”

There has also been a noticeable improvement in the time available to healthcare professionals. Maria continues: “RFID reduces our nurses’ administrative tasks, giving them more time to maintain a direct relationship with the patients.”
DRIVING RESEARCH: PROFILING POTENTIAL ILLNESS

Better data visibility will benefit the population generally, supporting evidence-based medicine to improve the treatment of individuals.

For example, central care record archives of data from screening services can provide much better research data than would usually be available in small scale clinical trials or by examining paper records.

Through genetic profiling it is becoming possible to assess which illnesses or conditions patients might be susceptible to. Individual ‘omics’ are currently used to investigate individual diseases against controls, mostly through identifying therapeutic and diagnostic markers.

This significant improvement in the way healthcare is delivered is being explored by a multinational academic group supported by Fujitsu in the UK. The proposition is that a valid personal profile which included genomic, metabonomic, orgomic and proteomic ‘fingerprints’ along with gene information will improve the quality and timeliness of advice for patients. To test the proposition, these profiles are compared to 1,000 broad disease groups.

The outcome is a unique and truly personalised approach for each patient that gives accurate diagnosis, accurate prognosis, knowledge about which drugs should be avoided and which drugs can be taken safely and effectively. From this lifestyle recommendations can be made both for the sick and the currently normal. In the longer term it may lead to stronger disease prevention protocols.

This, and other similar research activities, are highly information intensive and require high performance computing services.

IMPROVING NATIONAL HEALTHCARE IT INFRASTRUCTURE

Fujitsu in Finland is now contracted to provide the national electronic patient archive and an e-prescription service. This will be extended to include web services for patients to access personal health information, and a national electronic clinical document archive.

National information security for healthcare using PKI and Certificate Services is provided by Fujitsu, partnering with TEO, to all healthcare professionals in Finland.

Advanced technologies will support authentication, integrate hospital and primary care electronic patient records, and deliver information to national statistical services.

Fujitsu already works with twelve hospitals in the Hospital District of Helsinki and Uusimaa (HUS) providing IT infrastructure services called ‘Infracare’. The service solution was tailored to the specific needs and requirements of HUS.

Fujitsu also has similar Infracare delivery in five other hospital districts in Tampere, Turku, Kotka, Lappeenranta and Savonlinna plus private providers Medire, Dicor and ODL.

Infracare includes the management of 200 IT servers at Fujitsu’s Helsinki data centre plus on-site support for 35,000 workstations in hospital districts from Helsinki to Oulu beyond the Arctic Circle.

Fujitsu has responsibility for managing the IT environment and the co-ordination of IT system development projects including patient information portals, a consolidated patient record with high security digital signatures and key management for professionals and patients.
CHAPTER 4: Partnering with Fujitsu

Fujitsu is a truly global organisation with healthcare interests in a vast range of geographies and helping health professions and organisations.

We believe technology in the healthcare industry has one aim: to maximise clinicians’ productive time with patients by minimising the routine, time-consuming tasks that they are required to perform.

Mr Narutaka Nakao, Director of Healthcare Solutions Group, Fujitsu says:

“Fujitsu works together with healthcare providers to improve service on a partnership model. It’s all about us understanding the business challenges and working with the healthcare professionals to solve them.”

LONG-TERM VIEW

The quality, experience and expertise of our people are critical. Continual professional development and commitment to healthcare means we understand the daily pressures and the wider delivery challenges. This gives us the ability to produce everything from innovative processes and products to different way of working to meet objectives.

This is evident in many projects. For example, to provide a touch-less and non-invasive way to uniquely identify staff and patients without smart cards or passwords hospitals in Japan and the USA use our PalmSecure touch-less recognition technology.

Fujitsu has designed ways to deploy new technical services focusing on ways to accelerate and de-risk implementation. We’ve developed a unique set of best practice IT templates to deliver pre-built, pre-proven technical and managed services. For example TRIOLE lets customers combine new, innovative services with older legacy environments without the expense, complexity or time associated with a complete overhaul.

Fujitsu is among the first IT service companies to measure what matters and align services to deliver exactly what you want – with accompanying measurements of value and outcomes:

• Our long-term view of service levels within the healthcare industry is crucial.
  Healthcare organisations need to ensure that systems enhance their services and need reliability and consistency along with the benefits of large scale provision.

• New lessons are learned when we apply the principles of lean processes to healthcare. Lean thinking, made famous by Toyota, is commonly applied to production techniques and is being applied to services by Fujitsu. Lean processes concentrate on small steps towards constant improvement and teamwork.

• Customers want ways to monitor services to maintain optimal performance and we provide ways to assess the impact of a particular problem and then take steps to eliminate recurrence or cut the impact of the issue.
What NEXT?

You can get help from Fujitsu to assess, redesign, update, maintain and increase the value of your IT, and deliver extra value to your staff and your patients. Our services vary by country in response to local conditions.

To get more information and contact your local office please select the appropriate country healthcare or services section from http://www.fujitsu.com/global