State / National Health Information Management and Systems

Find all you need to know... The rationale, the process, the plans... The standards, the contracts, the buy-in... Architecture, specifications, user requirements, supporting documents... Advice, assistance and knowledge transfer. in these pages.

We've implemented it several times, we have a wealth of data, documents, and know-how ready to go to assist you with your own endeavours. If the articles you find here hit the mark, please ask us to package together a "primer" seminar of 6 half-day International Healthcare Workshops so you can short-cut the pitfalls and leverage-off the lessons learned from our past achievements - which include the **world's first successful** National Health Information Systems in New Zealand.

Please read and print this overview page, and then
contact us by email today (consultants@hic-ltd.com) outlining your particular interests or concerns - or
- to enquire specifically about our *'International Healthcare Workshops'* programs.

We'll respond and if you need them, we can send you copies of some key *White Papers* and / or *Articles* of particular relevance (ie discussions on the NZ experience). We welcome your interest in any of the following topics - please indicate those in which you are most interested:

Please Note! HIC is a provider of consultancy and services. With our advice and assistance, we can help you to understand and implement your own State / National Health Information Systems. If you need a Solution, we will be delighted to introduce you to several companies we know, who can and have provided such solutions. Alternatively, we can manage the RFP / selection process and help you to find the business partner that will provide exactly what you need.

Many healthcare systems have yet to make much real advantage from advances in information management and systems, which have transformed almost every other industry and business sector – but have only just started to impinge on healthcare.

Countries differ widely in their level of technology and preparedness to implement large scale information management systems. We have therefore outlined two plans – one is suited to the needs of less developed environments where telecommunications may be unreliable, and where use of computerised patient records systems is still uncommon. The other solution outlined here, is designed for more advanced environments with good telecommunications and extensive experiences with computers in healthcare.

An NHIS for well developed environments

Where environments already have considerable investment in health information systems and technology , it is often the case that the investment does not deliver the returns that it should. This is usually because the environment has evolved relatively uncontrolled, a big picture strategy has not been developed, vital architectural issues have never been addressed, and key infrastructural components are missing. HIC has developed the plan below, based on its successful initiatives in New Zealand, Europe and elsewhere.

1. Recognised problems with health information

The recurrent problems that are recognised in healthcare systems the world over relate to:

1. providing continuity and integrity of preventive and curative services to the individual; supporting team and shared care through bringing the relevant information together at the point of care delivery
2. positive identification of the patient and the provider for care and contracting; ensuring accountability and minimising opportunities for fraud
3. positive identification of the purchaser of care for that patient, the plan or contract and conditions under which the purchaser agrees to pay for services for that patient
4. monitoring care service quantity and quality; benchmarking and early identification of quality problems
5. monitoring trends in illness and service patterns; early identification of public health problems
6. allocating resources for the greatest benefit to community health status and equity of access to services
7. researching cost-effective protocols for care, and disseminating best quality practice guidelines
8. minimising duplication, waste and risk; maximising productivity, effectiveness and efficiency
9. ensuring the privacy and confidentiality of all personalised information
10. ensuring the integrity and security of all systems used for the management of healthcare information.

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2. Vital design and Process Issues

These, then, define the goals for an electronic information management system. Vital design issues are that:

- users must be able to connect to the system with the minimum of barriers (in terms of cost, technology etc), regardless of their location or of the specific hardware and software they use
- the solution must support best practices in relation to information privacy protection, and incorporate comprehensive security, audit trails and roll-back capabilities to permit definitive identification of the individual responsible for every transaction
- the solution must implement an infrastructure that facilitates value added developments and extensions by commercial organisations to the basic functionality: there must be something in it for everyone
- the solution must be open and contestable, with the minimum of "lock-in" to specific vendors, proprietary environments or products
- the solution must address the need to achieve rapid penetration across the entire health sector, where issues of cost, time, effort, skills, motivation and benefits will be prime determinants.

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3. Key Features of the Solution

Key features of the solution are:

1. an on-line unique identifier for health purposes
2. an on-line up-to-date and informative administrative data set for all uniquely identified individuals (names, addresses, date of birth, next of kin, purchaser, scheme, valid from/to etc)
3. an on-line up-to-date and useful core clinical data set for all uniquely identified individuals (emergency data, allergies, sensitivities, reactions, serious illnesses, treatments, immunisations, screenings etc)
4. a full collection of encounter reports to support contract management, shared care, oversight of performance, statutory returns, analysis, education, etc
5. an up-to-date information resource for providers outlining preferred protocols and best practices
6. a comprehensive resource for patients offering information about problems, conditions, treatments, alternatives, complements, providers, services, availability, cost and quality
7. a means for exchanging data (messages, images etc) between providers, laboratories etc
8. a set of value added services that is attractive to the users and encourages buy-in and regular use

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4. Benefits

A critical consideration is that of benefits: it is these that will constitute the driver for adoption. Patients can expect better care quality and reduced risk, and greater continuity and integrity of care, wherever they may be require it. Providers will be able positively to identify patients and locate records for them, will have access to better information to support the provision of high quality shared care, and will know who is the purchaser and the provisions of the care contracts. Purchasers will have better data for contract management, monitoring performance and detecting fraud by patients or providers, and for investment decisions: they will also benefit from the improved efficiency and effectiveness of care services delivery. Funders will be able to fulfil reporting obligations (eg to WHO), plan service priorities, allocate resources and compare performance against international benchmarks. The private commercial sector will have opportunities arising from this initiative and the general improvement in the market-place, and from development of value added services.

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5. Avoid Failure – don't overlook

Before we outline the HIC solution, a brief word of warning. An undertaking as complex as this requires much more than just a technical solution. It requires the 'buy-in' of the stakeholders – funders, purchasers, providers and the community of patients – who must all have confidence that it will bring them benefits whilst not exposing them to risks. The familiar security triad – availability, integrity and confidentiality – are vital here, but so also is aa appropriate management structure and organisation. This must be such as to give the stakeholders confidence that the systems and services will be managed for the benefit of the health sector as a whole and not just for one stakeholder (often the government), and that they will each be able to have their say in the future development directions of the system to support services that they require.

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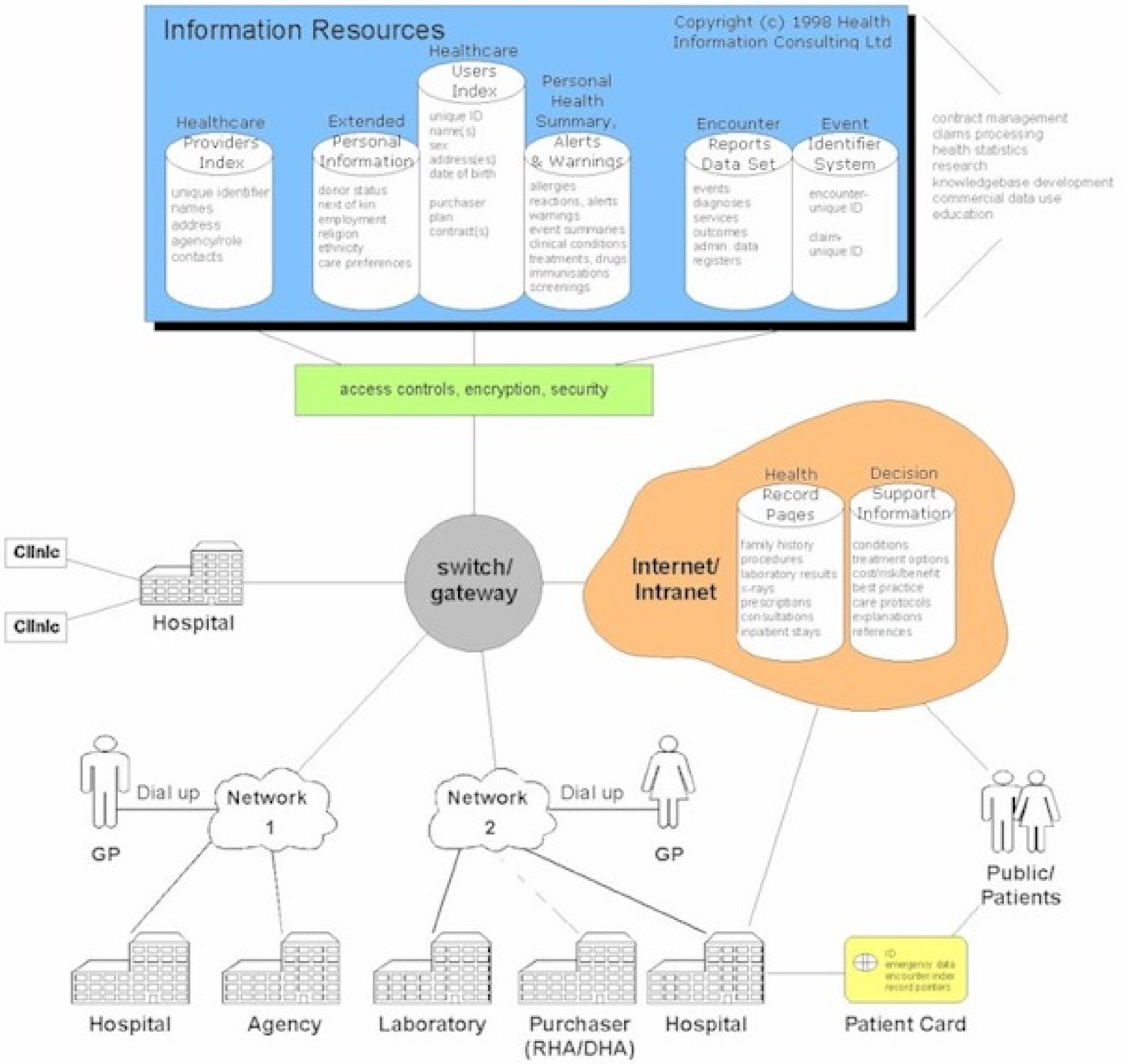
6. Solution Outline

Figure 1 illustrates schematically the solution outlined and discussed below.



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6.1 Healthcare Providers Index

Please feel most welsome to contact us for information about Healthcare Providers Indexes and web-based Provider Networks.

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6.2 Healthcare Users Index

The Healthcare Users Index (HUI) database constitutes a register of all users of health care services, and assigns to each individual a unique health identifier. The HUI records the user name, address, date of birth, gender, ethnicity, and aliases (alternate registrations with the same HUI number); it also holds a trail of previous names and addresses. It is accessible on-line to all authorised users.

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6.3 Extended Personal Information

The Extended Personal Information is also accessible on-line, and records the responsible purchaser for each individual, the plan (s), contract(s), duration and condition(s) of the agreements, the individuals wishes regarding organ donor status and identified next-of-kin contacts. It can include additional data held at the request of the patient.

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6.4 Personal Health Summary, Alerts and Warnings

The Personal Health Summary, Alerts and Warnings (HSW) System maintains an index and synopsis of past significant care encounters, of the care providers and of where records are held. It also holds a cumulative summary of significant medical conditions (conditions and treatments), allergies, sensitivities, idiosyncrasies and drug reactions. The option exists to include a record of immunisations and of preventive and/or screening care.

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6.5 Encounter Reports Data Set

The Encounter Reports Data Set (EDS) database constitutes a record of health care events and encounters gathered from across the entire health care system. The reports identify an appropriate set (depending on the type of encounter - eg inpatient, ambulatory, day case, community care etc) of the date(s), provider and type, institution and department, service(s) and reason (s) (eg diagnosis) relating to the care encounter, together with administrative information which may include identification of the contract(s) under which the services were provided. Special datasets have been identified for particular types of care event, such as births and deaths, cancer (for a separate cancer registry) and care events subject to the provisions of the mental health act, reports of all of which are collected using the same system. When stored these datasets include no personal identifiers but simply an event identifier and some generic tags (eg male, aged 60-70 etc) to facilitate analyses whilst at the same time protecting personal privacy.

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6.6 Event Identifier Systems

For the purposes of efficiency of claims management, a Event Identifier System (EIS) is established whereby every claim from a provider relating to a defined care event (defined by date) for one individual patient is assigned a unique identifier. This system applies to all services whether provided in the community or hospital settings. Thereafter the (electronic) handling and processing of that claim can be managed by the purchaser without the identity of the patient ever being revealed, except where required for audit purposes. Full hard copy records (eg of prescription, test result, record of care, discharge summary etc) must be kept by the provider, tagged with the EIS number: these will be required to be produced for systematic and/or random audit.

Once an EIS number has been assigned, the claim itself can then go forward and be processed automatically. Since the associated service data supporting the claim is held by the provider and is available for audit, the claim itself can be processed safely with little or no supporting data other than the relevant EIS number. If the medical records interchange option is adopted (see below), a pointer to the synoptic data for the event can be included to enable the purchaser to obtain more information about the nature of the care provided.

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6.7 Decision Support Information

The Decision Support Information (DSI) system is a resource of information designed for the use of patients as well as providers. The data is derived in part from analysis of the national reports of care encounters accumulated in the EDS database, and in part from international experience and biomedical publications. The information is structured within a Hypertext environment on a (WWW) server, providing advice on clinical guidelines, care options and alternatives, costs, risks and benefits, drugs, side effects and interactions, care providers and facilities, health statistics and much more. The system also acts as a conduit for important information from the funder(s) and/or purchaser(s) to the sector about health hazards, new policies and procedures and so on.

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6.8 Networks (incl messaging standards, encryption, access control)

The use of normal commercial networking services is likely to be the most cost-effective: this arrangement creates a situation where competing network providers will be encouraged to carry out the marketing of these services and benefits and to develop value-added services to attract their potential clients, so reducing the need for further central investment in achieving user take-up. Messages containing personally identifiable data (ie between users and systems 5.1-5.4 above) must be encrypted.

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7. Extended Options

Since the NZ system went live, Health Information Consulting's principals have been involved in development of further options for extending the functionality of the solution in the light of emerging key technology (eg the Internet and World Wide Web), needs (eg the exchange of medical records between many disparate clinical systems), and socio-cultural perspectives (eg concerns about confidentiality and security). Various options to extend the functionality of the system have been developed and are briefly outlined.

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7.1 Medical Records Interchange Option

The option to exchange medical records between users of the system is available. A summary of every care encounter is passed to the EDS, often with some elements in coded format (eg ICD) primarily for use in contract/claims management. A more detailed edited clinical summary of the care event is passed through a process whereby all contextual identifiers (patient ID, provider ID, location, clinic, date, time etc) are removed, and the event is assigned a unique reference identifier, which is added to the personal HSW data for that individual. The de-contextualised event summary itself is loaded onto a clinical event server (a modified web server) where it is held in mark-up language, and may includ images and sound bites. This record, which is not a risk to personal privacy after decontextualisation, is accessible to any individual with the requisite access authorisation and token. The patient holds the key to the missing context data, so that the full record can only be re-assembled with the consent of the patient. The patient can use the same browser facility to read his/her own data, to note any errors that may be present, and to and to seek independent advice regarding their problems and care if they have concerns.

This approach has the added advantage that it obviates the need for all providers to be linked in to the network at all times in order for their records to be accessible to other users. Many providers are reluctant to permit other computer uses to access their practice management systems, for obvious reasons. Adoption of the above approach means that summaries can be retrieved at all times and with no security risk to the provider, even where a provider is not linked into the network at a particular moment in time (eg a remote dial-up user).

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7.2 Smartcard Option

The option to make use of smart cards, authenticated with an encrypted photograph, biometric key (eg fingerprint) and/or code (eg PIN), has been incorporated in this plan, in line with planned developments throughout Europe and other parts of the world. This provides for enhanced security, and added robustness in cases where there is a risk that telecommunications links could be interrupted. The card can carry selected elements of the data included in the Healthcare User Index, Extended Personal Information and Health Summary Alerts and Warnings databases outlined above: it can be used also to advantage in the claims management process, as well as in the management of any required co-payments and insurance subscriptions. The card demonstrably puts the patient in control over who has access to their personal information.

Selected data from each care encounter can be stored on a World Wide Web (WWW) server in mark-up language (HTML) format. These records are stored unencrypted but without any personal identifiers whatsoever. The patient card is used to hold a pointer to each of the records belonging to that patient, which can be retrieved using standard Internet browsers from anywhere. The doctor holds the personal information that is missing from these records and is therefore able to reassemble the full record. This supports the need of shared care, and of all unplanned episodes (eg emergencies, unanticipated needs etc) where care must be provided by a doctor who otherwise might know nothing whatever about the patient. The card can then be used to give the patient direct access (eg from home) to read their own records, to check on their accuracy and authenticity and to ask trusted advisers for explanations or opinions about their contents.

Please refer to the media index for articles relating specifically to 'Smartcards and Unique IDs'.

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8. Privacy and Confidentiality

Please refer to the media index for articles relating specifically to 'Security'.

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