

Health Informatics  
7<sup>th</sup> April 2005

Elbrus Room  
Pacific Place Conference Centre  
Level 5 One Pacific Place, 88 Queensway, HK

Executive Summary

Session One

1. Health Informatics as a theme for this forum was suggested by **our sponsor, Intel**, a leader in the field, and follows naturally *Putting Services into Broadband* ([http://www.trp.hku.hk/tif/papers/2003/oct/summ\\_papers\\_031014.pdf](http://www.trp.hku.hk/tif/papers/2003/oct/summ_papers_031014.pdf)) a TIF conference held October 2002. Around 100 participants, public and private sector health and welfare professionals, consultants and vendors, met together in what proved to be an extraordinarily rich and highly productive exchange of information and views. One came away feeling that this forum had kick-started discussions that had stalled around the time of SARS, and that TIF was a catalyst for further collaboration. That is heartening because it is exactly the objective of TIF forums. **TIF thanks Intel** for helping to make this happen.
2. Elizabeth Quat, President, iProA chairs Session One. Members of iProA (Internet Professionals Association) have been especially active in the health IT field. Elizabeth introduced **Mrs Carrie Yau, Permanent Secretary for Health, Welfare and Food** who provides a review of Government policy perspectives under the title 'Health Informatics for the Betterment of Health Care in Hong Kong.' Mrs Yau was previously the chair of the Government's Information Infrastructure Advisory Committee, and in that capacity had been responsible, among other things, for steering through the Smart ID programme.
3. Mrs Yau begins by noting that Hong Kong has been progressively introducing and upgrading IT systems in the health care sector, maybe against popular misconceptions to the contrary. She refers to the current central clinical management system (CMS) for data sharing in Hong Kong that, for example, allows doctors to check the names and availability of drugs at the click of a mouse. This may soon be extended to the private sector. The Health Department also provides Internet access to various medical information programmes, such as Men's Health and Cervical Screening. Hong Kong also won international accolades for linking the police criminal investigation system, MIIDSS system, with the e-SARS database of the Health Department. Anticipating what the speakers from the Hospital Authority would mention, Mrs Yau also refers to the

PACS system (Picture Archiving and Communications) that allows for the storage and retrieval of a vast digital medical imaging archive.

4. Turning to the Government's current priorities, these are first, family medicine, and second, disease prevention. There is a tendency in Hong Kong for family members to go 'doctor shopping'. This compounds a problem, because many private sector doctors do not use computers or keep electronic records, and sharing patient records becomes difficult and an unnecessary duplication of resources. The Hospital Authority is introducing by stages a general outpatient clinics (GOPC) medical records system, and because most outpatients also see private doctors this may help bring greater coordination between the public and private sectors. To tackle outbreaks like SARS and pandemics, the Government is developing what it currently termed a 'communicable disease information system' or CDIS to provide real time data to monitor and contain outbreaks. CDIS will link to public and private healthcare sectors, emergency services and non-medical institutions. The system includes an infectious diseases portal to disseminate information to professionals and the community.
5. Mrs Yau notes that the growing use of IT systems and databases raises security, legal and ethical issues, but these must not prevent the adoption of health informatics. She ends with a plea: 'May I take this opportunity to appeal to all our partners in the private sectors to embrace the change and always look for the opportunity to enhance your service with IT. Link your work up with systems of the public sector and work hand in hand with our health authorities to further the development of e-health in Hong Kong.' **This appeal is taken up in Session Two, with the practical obstacles identified as well as the opportunities. A key point from Session Two is also 'who owns the medical records'? And the answer seems to be 'the patient should be the real owner' and it may be that Government should clarify that point in legislation.**
6. **Mr Ross Burger, Healthcare Industry Solution Architect, Intel Asia Pacific** is the second speaker on the theme 'Mobility Usage Models Transforming Healthcare.' Ross explains just why Intel is so interested in this area. It is part of Intel's overall strategy to build scalable and extensible communications platforms for vertical industries. That implies an in depth and specialist knowledge and understanding of the industry, and as Jimmy Yeung adds during Q&A, Intel has set up a specialist Digital Health Group for this purpose. Ross gives several examples of hospitals who have been clients of Intel, including the development of longitudinal electronic health record (LHR) programmes.
7. Central to **Intel's vision** is the concept of a patient-centric 'digital hospital' that unites clinical processes with the business side. This concept was debated in further detail in Session Two, including security and commercial issues, with parallels being drawn with a number of 'networked industries', such as finance, insurance, air transportation. Ross précised the argument: 'In essence, it is now quite feasible to design and deploy a public, secure and personalized platform that

- enables clinicians and patients to access medical information and services in the same fashion and with similar convenience as they would expect from financial institutions. Perhaps using smart cards in the same way that ATM cards are being employed...'
8. **Intel** sees various stages towards the implementation of this concept which correlates to the penetration of the technology, what Intel calls the 'PC-to-bed ratio'. Training clinicians to use the technology is as important as installing the platforms, and stage two of this 'reference architecture' involves the use of mobile and wireless access devices. This 'service-oriented architecture' must be flexible to integrate with legacy systems, and with 'applications built to new standards such as Web services, Internet protocol and mobile protocols.' The term 'mobile' can relate to many different levels, to the devices, to the platforms, to smart cards and RFID technology, to patient's data, etc., but delivering better service to the point-of-care is the key attribute. Designing systems, including common standards that deliver better health care, including the integrated use of technologies such as mobile and wireless devices, is Intel's forte.
  9. Speaking at his first TIF forum since joining the Government, **Mr Howard Dickson, Government Chief Information Officer** was the third speaker in Session One, 'role of smart cards as carriers of personal data and information.' He explains that his previous work experience includes being a member of the ATM Card Standards Committee of the Canadian Payments Association, an experience that is relevant to finding common ground among competing commercial interests, for example between the public and private health care sectors. Howard makes more of this point in Session Two.
  10. Hong Kong's smart ID card was part of the Digital 21 project, under the guiding hand of Mrs Carrie Yau in 2001. The twofold objectives were to provide a secure permanent identity card and public services through the provision of multiple but separated applications on the card. The solutions adopted were advanced card production technologies to achieve card security, and the public key or e-Cert approach for secure transactions. The inclusion of the latter is entirely voluntary. The voluntary principle is one that comes up again in Session Two during the discussion of whether personal and private medical records should be accessible through the very 'mobile' smart card. The trade-off really seems to be between a secure e-Cert which has yet to prove popular and a less secure access procedure (for example, using a PIN) whereby people can choose their level of risk. For many people, having basic medical information easily available is generally a positive thing, for example allergies, whereas having highly sensitive information, for example HIV-positive, may not be. But for the moment, 'a wide range of off card applications including those for the healthcare industry can be supported through the use of our smart Hong Kong permanent identity card.'

## Discussion

11. The Q&A session begins with an exchange of views about the use of mobile devices in healthcare. **Mrs Yau** welcomes the idea of mobile platforms ‘now that you have heard from me the new policy directive, for instance, in trying to produce portable e-medical records.’ **Howard Dickson** also sees it as ‘extremely prudent to start tapping into this sector.’ **Dr C.P. Wong** of Ruttonjee Hospital, and speaker in Session Two, raises two questions, one about the security of PDAs, and the other about their cost if they have to be replaced every two or three years (as another questioner points out) across the entire Hospital Authority. **Ross Burger** makes two points in response. First, **Intel** advocates storing the information on a database server, not on the PDA itself. Second, Ross and his colleagues have ‘just over the last few days’ been discussing with factory managers and OEM partners ways ‘to reach a price point that makes these devices affordable, realizing that public hospital authorities are under price pressure, not only in Hong Kong but in other parts of the geography.’ Ross adds that Intel is exploring special devices called SKUs that can offer cost-effective solutions, a process that requires lots of feedback from users.<sup>1</sup>
  
12. In response to a question about where patients’ records are actually stored, and that e-Certs do not work on Macs, **Mrs Yau** makes the argument for interoperability of public and private systems, with the voluntary principle on behalf of the patient as being important, but in reply to a question about sharing with China she is more cautious in stressing the need to know in advance what it is you want to share, for example information about disease control. On the contrary, personal data sharing raises legal protection issues. **Ross** adds that who ‘owns’ the medical records is one issue, and a good example where records sharing may be beneficial is ‘medical tourism’, for example in this region where people go to Thailand for cheaper medical services.
  
13. A third line of questions welcomes the idea of greater public-private participation. Mrs Yau welcomes this ‘because the whole service model is moving from a sort of institutionalized patient care to ambulatory patient care, namely that we are moving patients back to the community.’ **Dr Joseph Lee of the Baptist Hospital** (who joins the Session Two panel on behalf of the Private Hospital Association) laments the private sector has been lagging behind, but is ‘very keen to get moving forward together with the HA on the sharing of platforms and data.’ It would also ‘be wonderful if I could have a hand-held and when you walk into a hospital, I push it and I find out where my patients are, in which room, so I can walk to see them’ **Ross** is quick to point out that this location-based service is actually available. Another questioner asks if the Health Department and the HA are adequately coordinated in light of infectious diseases, to which **Mrs Yau** agrees the HD should link into the HA, but ‘whether it is tapped into each and every system of the HA will have to be justified on a case-by-case basis.’ This is a

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<sup>1</sup> There is a growing recognition that users are not just a vital source of product information but a key source of product innovation. See especially the work of von Hippel <http://web.mit.edu/evhippel/www>

timely reminder that IT may come in ‘waves’ of innovation, but the implementation process more often comes in ‘ripples’.

## Session Two

14. **Dr C.P. Wong, a founder of the Hong Kong Society of Medical Informatics Limited**, leads off Session Two with a ‘History and context of health informatics development in Hong Kong.’ The history of medical and health informatics in Hong Kong is very much the work and personal achievement of Dr Wong and his colleagues in the Hospital Authority. Dr Wong explains that historically, Hong Kong started quite late, but from 1990 with the formation of the HA, the adoption of IT progressed through various stages of systems development, done entirely in-house. A stark reminder of the progress made, in 1990 the Health Department had a three year delay in publishing health statistics. The first step was to link all 40 hospitals with a PC LAN-based network. The computerization of drugs and labeling came next, then hooking up all computerized biochemistry machines, then radiology departments, then all HA hospital information systems into a single repository for electronic patient records (EPR), and so on. Most recently has been the e-SARS system and consideration is now being given to extending the CMS (clinical management system) to an IP-based next generation network system. The HA now runs the second largest computer system in Hong Kong, after the Jockey Club and ahead of HSBC.
15. Five years ago the HA adopted a more structured framework (rather than free text) for laboratory, X-ray and clinical information, and then added a medication decision support function, and currently the HA is installing a system for checking drug allergies. These systems, together with PACS for image storage and retrieval, place Hong Kong among the world leaders in health informatics, despite Hong Kong spending only 1.4 per cent of its HA budget on IT compared with higher percentages in other countries, typically 2.5 per cent to 5 per cent. Clearly budget cuts of recent years will need to be reversed if the HA, and Hong Kong, is to progress to the next level.
16. **Dr Wong** refers to the proposal for a Health Information Infrastructure (HII) plan before SARS, and the need to rethink the needs for an integrated health informatics for Hong Kong. Under the reorganization of health care services, the HA is now responsible for all outpatient clinics as well as for 700 homes for the elderly that previously came under the Health Department. ‘Every month we visit every elder home in Hong Kong and in fact, we are installing more than 30 computer systems in the elderly homes as our satellite clinics, because the elderly are our customers, our favourite customers. One-fifth of our total admissions come from the elderly homes, so actually we are linking them up.’
17. Hong Kong has achieved a leading world reputation in health informatics. ‘But what is lacking?’ asks **Dr Wong**. **‘I would like to point out that less than five of the 400 people working in the IT division of the HA receive any training at all in health informatics. In the universities, there is no degree course, no**

**masters course, not even a certificate course, so this is one point I wish Mrs Carrie Lau... she will urge the universities or any tertiary educational institution to really think that we should try to set up such courses to make sure we can have a way forward to making more experts rather than importing from the outside.'**

18. Following this plea, and taking up the next phase of the story, **Dr James Kong, Consultant (Health Informatics), Hospital Authority**, addresses the issue 'The next phase in medical informatics for Hong Kong'. Dr Kong picks up from the reference to a HII. 'This digital health community as we see it has been basically written by PricewaterhouseCoopers.'<sup>2</sup> Dr Kong sees it as multifaceted, with the patient at the top, and in answer to who owns the medical records, he replies 'The patient owns the record.' For Dr Kong, IT should be handed over to IT professionals to leave doctors to get on with their work as doctors, and the system should be designed to make this happen to the benefit of the doctor-patient relationship.
19. HA put out an RFI (Request for Inquiry) not an RFP to discover what was available, what concepts and technology for health care platforms were emerging. The HA received 'vapourware', or immature and untested solutions, but also some solutions which in the opinions of some of the HA's experienced users were quite intuitive to use. Moreover, 'we also received some proposals that offered the vendors' framework and these were from vendors who are using these frameworks to develop their own suite of products. That acknowledges their understanding of our environment, understanding of our capability and their willingness to partner with us because they came up with some very interesting partnership proposals as well.'
20. Public-private partnerships are therefore not confined to data sharing, but can include vendor-HA arrangements, which makes sense if the HA has in-house capabilities and above all user-led ideas for innovation. Given the priorities of Hong Kong's Government, the HA is under pressure to address its budget deficit. Priority this year is also to address the billing systems. **Dr Kong** does not believe that the HA should get involved in building IT applications, but rather to redesign ways of working to utilize technologies that will enhance ways of collaborating more with the private sector doctors.
21. **Dr John Fung, Director, Information Technology Resource Centre, the Hong Kong Council of Social Service** is the third speaker in Session Two addressing the issue 'Informatics and social welfare.' John explains the HKCSS spans over 300 organizations and 85 per cent of all social services in Hong Kong through over 2,500 centres. There has been a paradigm or developmental shift in social care towards seeing 'people in context'. For example, 'instead of looking at patients having a psychological problem which is related to a physical problem, we now look at patients or clients as having one problem but with multiple

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<sup>2</sup> This is a reference to HWF Bureau (2002) 'Health Information Infrastructure Project Definition Study'

- manifestations.’ So taking a holistic approach also implies that interdisciplinary collaboration is required, also allowing the involvement of patients as well (‘in operational terms we call it care in the community’) and ICTs (information and communication technologies) can facilitate this. Here John is reinforcing the message from Mrs Yau that the new focus on family medicine and community care require (mobile) information sharing systems.
22. The social welfare services already adopt IT, such as safety alarm systems in patient’s homes, and home help workers are encouraged to use PDAs to enter reports that can be directly uploaded into a database. **Dr John Fung** here echoes the hope that Intel can get the price of device down. But other problems concern organization. One example is the need to automate the referrals systems between social welfare services and hospitals. ‘Currently, for example, a medical social worker of a public hospital referring cases out to the community for home care would not have access to a database showing availability of such services, nor would he or she know the length of the waiting list.’
  23. Finally **Dr Fung** makes the key point that ‘having an interoperable network infrastructure is a necessary but not sufficient condition for improving the quality of healthcare.’ Different stakeholders must be brought together, and that ‘financing of all these is secondary to the establishment of the correct policy directions.’ These must include issues of human rights and liberties and privacy protection. The scale and complexity of integrating all these themes implies not the Big Bang approach but rather a considered and inclusive incremental approach.

### Panel Discussion

24. **Dr Joseph Lee of the Private Hospital Association** (who joined the panel of speakers, that also included **Howard Dickson** and **Ross Burger** from Session One) explained that the 12 private hospitals are competing against each other, they not united under one roof like the HA hospitals, and their adoption of IT remains ‘very minimal’. The Baptist Hospital has had to develop some software of its own because ‘there is no solution that we can easily get and buy and use’ and that is true for the other eleven hospitals. But they are very keen to join in record sharing with the HA. **Dr Lee** agrees wholeheartedly with **Dr Kong** that ‘the patient owns his record’ but ‘how that information can be shared has to be defined before we can really move ahead with a lot of other things.’ **Dr James Kong** added that since the private sector is small and separated into competing hospitals, the vendors should come up with workable solutions to records sharing. For example, ‘an ASP (applications service provider) service is currently the model for most things out there, but in the healthcare sector in this town, there is not one.’ It was not the role of the HA ‘to provide that data warehouse so that the Internet is there and people can access it.’
25. A participant from Octopus Card explained their business model, which rests on an ‘incredibly pragmatic approach’; if the Octopus solution can cut cost from the

collection of revenues (for example, fares on the MTR and KCR systems) without damaging the competitive position of their clients, Octopus has a business. The question is, can this somehow be applied to records sharing? [Unlike the fares paid by travelers, client (patient) information represents potential power in a market situation unless the ownership of that information clearly resides with the patient. So the next step is access to that information, and perhaps this is where the problem lies due to proprietary systems and the unequal size of the databases and resulting imbalance of traffic between the HA and private systems. – editor]. **Ross Burger** comes into the discussion at this point. ‘While the patient owns the medical record, their primary physician and the primary point of secondary care, the hospital, can be the repository of the record. And given a shared-service environment that leverages what we call service-oriented architecture, where that record can be retrieved via an authentication method, it then alleviates the cost of building a separate infrastructure, an image database that has to house these records and has to be operated as a separate point of delivery, and develop a whole new business model around that.’

26. **Dr CP Wong** puts the problem in stark terms. In Hong Kong less than 15 per cent of private sector doctors have computers, so ‘how can you expect the HA to give out everything and receive nothing from the GPs? This is the real discussion. So that is why the discussion has stopped completely, at that point.’ He gives examples of the same problem from Taiwan and Singapore. In Taiwan, hospitals are private and the government operates a medical record clearing house system, but ‘they just give very simple things like diagnosis, drugs, laboratory and no more’ whereas the physicians keep all the important records, such as operations and progress notes to themselves. In Singapore, ‘they have only two clusters of hospitals, but the two clusters do not talk’. In this sense the problem is a human one. Mrs Carrie Yau said ‘we should head in that direction, but I think that direction is still a far way.’ It will happen only where doctors are good partners with each other, and not otherwise. **Dr John Fung** supported this, saying that doctors and social welfare workers are often on close terms and share information on that basis.
27. **Elizabeth Quat** (iProA and Chair of Session One) recalls that during the SARS epidemic, seven IT companies came together after an IT and Health Forum to work out a proposal for a Centre for Disease Control.<sup>3</sup> The situation was just as Dr Wong outlines it. ‘That was the 13<sup>th</sup> July and I remember the last day of July 2003. So from that day to today, it is more than one year and we are still in the same space and we are not moving any way, so I think we have to do something actually.’ [Is there more that TIF can offer here? – editor]. **Howard Dickson** reminds us that ‘the experiences we went through of getting competitive entities to co-operate to have electronic banking work, and some of the things we learned will apply and honestly, some will not.’ He added the examples of the insurance and securities industries. Patricia Lau (PA Consulting) added the example of airlines and the reservation and check-in systems. [Where there is a will there is a

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<sup>3</sup> See [http://www.iproa.org/iproa/TTwhitepaper\\_v11.PDF](http://www.iproa.org/iproa/TTwhitepaper_v11.PDF)

way, but finding how to save money in the system and who shares in the savings is perhaps the trick.- editor]

28. **Dr John Fung** believes there is nothing wrong with the idea of patients downloading their full medical record onto their smart card and taking it with them to their chosen doctor, and the Privacy Ordinance allows for that. **Dr James Kong** reiterated his view that the important use of IT was to free up the doctor, and to find a system that did not leave it up to the HA or place it on the HA's budget to manage the sharing process. **Ross Burger** notes 'In the US they have a fair Credit Reporting Act which is part of the law in the US that specifies who owns the data and how that data could be moved from one provider to another. I think that is where the ownership of the record needs to be addressed in terms of policy. Then once that policy is put in place and enacted, then there is no gray area as far as how a private clinician in private practice would treat that record any differently than in public practice.'
29. A final question arose on what **Ross Burger** calls 'health tourism' and the tradability of health care services. **Dr James Kong** sees this as exclusively part of the private sector's market. **Dr C.P.Wong** supports Hong Kong developing itself as a regional healthcare services centre, but believes it will require collaboration with vendors. **Ross Burger** gives examples of where Intel has been active with hospitals in Thailand. 'It attracts not only clinicians from abroad who they want to add value to their healthcare delivery system, but also as patients come from abroad, it does support other sectors of their economy.' [Needless to say, the key issue here is whether it adds to the sum total of healthcare resources available, or becomes a zero-sum game by pulling doctors from the public health sector. - editor].

## Conclusions

30. The Background Briefing paper<sup>4</sup> pointed out that health informatics was not yet reflected in the Government's Digital 21. This forum brought out three essential points. First, Hong Kong in public sector healthcare especially has made enormous progress by world standards in introducing ICTs but there is a way to go, not least in achieving electronic record sharing between the public and private sectors to the benefit of the patient. Second, discussion along these lines seems to have stalled in recent years, especially since SARS. Third, the discussions need to take a holistic and inclusive approach. Compartmentalizing health and social welfare issues is history. Perhaps now is the time to reinvigorate the debate, and from Government's perspective that could be a preparation for including health informatics in the next edition of Digital 21.
31. Who owns the medical record? The answer seems to be 'the patient' and with legislation to remove any ambiguity and legal doubt the way could be cleared for

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<sup>4</sup> Health Informatics [http://www.trp.hku.hk/tif/papers/2005/apr/briefing\\_050407.pdf](http://www.trp.hku.hk/tif/papers/2005/apr/briefing_050407.pdf)

finding solutions to, and working out the modalities of, electronic records sharing between the public and private sectors.

32. Security of medical records is probably best handled by storage on backend systems, and not on access devices such as PDAs, although patients appear to have the legal right to store vital data on their smart cards if they choose. The cost of access devices is a related issue, and vendors can best drive down the costs by working closely with the users in designing low-cost handhelds that do the job required. The healthcare market is global, and includes all developing countries, so economies of scale should exist, at least for the first mover.
33. There are apparently no courses in Hong Kong's universities or tertiary institutions, unlike Singapore, that cater for health informatics.<sup>5</sup> Is this an example of a lack of correspondence between Hong Kong's educational system and its economic and social needs? There would seem to be good reason to explore courses in the wider user and applications of ICTs across a range of service sectors.

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<sup>5</sup> The National University of Singapore is a member of the Star\* (Star Alliance) of eight institutions worldwide with an 'S' in their title, such as Stanford and University of Sydney, that offer modular courses in genomics, bioinformatics and medical informatics. <http://www.s-star.org/main.html>