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Improving your competitive advantage through e-health strategies

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Following is an outline of our presentation, to accompany the PowerPoint slides.

Defining e-health - where are we?

John Mitchell

E-health is health's version of e-commerce: that is, conducting health business electronically. E-health is the combined use of electronic communication and IT in the health sector, both at the local site and at a distance for clinical, educational and administrative purposes (*Unstoppable rise of e-health, 1999*).

E-health is a broad, encompassing term that envelops information technologies and telecommunication technologies. Telehealth, the provision of health at a distance using telecommunications, is subsumed by e-health.

Unfortunately there is a lot of confusion about this new field and some vendors are getting onto the hype bandwagon by adding "e-" to old solutions. Many new initiatives remain unproven, and, like modern art, time will tell which shall endure.

Users' strategic goals and end users' needs should drive solutions and not the vendors or suppliers' business models. However, sometimes the users' needs are latent and thus it may be very difficult for us to identify sustainable competitive advantage in e-health. We will present some ideas on an approach that we hope will help you create sustainable competitive advantage.

There is much activity in Australia in the e-health area, and we have had some success, in areas such as call centres, radiology, pathology, psychiatry, pharmaceuticals, smart cards and staff development, in particular. We are now moving beyond the stage of telemedicine trials and telehealth networks. There's a new commercial focus on electronic health records and supply chain management.

The increasing Commonwealth activity with initiatives such as HealthConnect and similar State/Territory initiatives are creating the environment for e-health to develop. Steadily business and political imperatives are emerging.

Foundations for e-health.

Dr Andrew Cottrill

Ladies and Gentlemen, I would like to thank John Mitchell for giving me the opportunity to share with you some of my perspectives and experiences. I am new to your country - I only arrived at the beginning of

this month - therefore I do not profess detailed knowledge of Australian health informatics, however I hope I can provide you with some international perspectives from South Africa.

I would like to begin by describing the foundation structures which are essential requirements if e-health is to flourish.

Telecomm Infrastructure

The first, and obvious foundation is a strong and ubiquitous telecomms infrastructure. This, however, still is found wanting. Deregulation and enhanced competition are vital in this sector. Unlike Australia, in South Africa we still have a monopolistic parastatal telecom operator, although a second operator is to be announced this year as is the privatisation of the state operator.

We have a glut of high bandwidth connections globally, yet the "last mile" to reach the end user is largely copper cable at low bandwidth. It is very encouraging to see that Australia plans to enable 90% of users to be able to access ADSL (Asynchronous Digital Subscriber Line) within two years. This will obviously promote the uptake of products, improve reliability, foster user acceptance, and the advantages of "always-on" connectivity will enable a level of sophisticated product offerings to exist. The situation in South Africa is slightly behind Australia in this respect, we have only just begun piloting ADSL connections, and the mal-distribution of services to heavily populated rural areas is a challenge.

Progress is being made, but before e-health can emerge we have to have improved reliability and robustness.

Information Exchange Standards

Telecom infrastructure supplies the medium for information exchange. We also require standards for information exchange. These are beginning to emerge, but there still remains much work to be done.

There is much talk about XML (eXtensible Markup Language) as standard for exchanging data elements, yet this requires defining the medical meta-data set so everyone can agree how to label health care data entities. Certainly there is considerable consciousness about XML in South Africa. HL7 is also being used. I am aware of its use by two large healthcare intermediaries (claims handling agents), both of whom claim that HL7 still required some "customisation" for their purposes.

Other important information exchange standards include e-mail protocols, and the older electronic data interchange standards such as EDIFACT. We require standard ways of accessing databases such as SQL and MIQUEST, a healthcare data query language being used in the UK to access clinical data from practice management systems. The Electronic Health Record too, may be viewed at this level as a "standard" for storing and retrieving clinical episode and encounter data, as distinct from a particular software application or database server infrastructure.

On the whole the progress in this vital area is good and is improving all the time.

Nomenclature

The next important foundation level for e-health is nomenclature. This is a way of uniquely naming and identifying medical and related entities. It sounds simple, but even after years of work, we are still far from a comprehensive solution here.

Even identifying simple data entities like patients and providers still eludes us. In South Africa we use a combination of scheme, member number and beneficiary code to identify a patient. This prevents us tracking movements of patients between insurers and creating a life-long health record. Although provider identifiers exist, administered by the Health Professions Council, they are little used by the health insurers, who work with practice numbers. These practice numbers fail to identify the individual doctor in a group practice. I believe that similar difficulties exist in Australia.

ICD-10, the World Health Organisation's diagnostic coding system, is becoming the standard for use in South Africa. This is after many years of discussions and committees. Even here, however, the system is seen as deficient. It needs to be modified (and each country does its own thing), hence ICD-10 AM. This problem probably has historic roots to the origins of ICD as a way of gathering mortality statistics, rather than morbidity statistics.

Other entities need to be described. Procedures, for example. In South Africa we still use a home-grown cumbersome system (Board of Health Fund codes) which denies us the opportunity to make international comparisons. We will be gradually changing to CPT codes, although this is a cut-down customised version. Drugs have for many years been identified by a defacto standard called NAPPI, which is still owned by a large pharmaceutical benefit management company.

Clinical Standards

Once we can consistently and comprehensively describe medical terminology, we need to be able to consistently and comprehensively apply clinical diagnostic and treatment criteria. It is simply not enough to make a diagnosis of non-insulin dependent diabetes. What was the basis of that diagnosis? Random blood glucose? Fasting blood glucose? Glucose tolerance test? Historic information supplied by the patient? Without some consistency here how can we be sure what one person calls diabetes is the same as what someone else calls diabetes. Such consistency is important for research, quality monitoring, outcomes measurement and such like.

As we evolve these higher level (healthcare rather than IT) foundations for e-health, things start to get more fuzzy and difficult. We are starting to turn to evidence based medicine, protocols and formularies to inculcate greater consistency of practice.

Mind Set

Finally, the last foundation for e-health is mind set. This involves sorting out the issues of access to data, confidentiality and privacy. Proving the value of these technologies to clinicians in order to promote their use.

There needs to be an awareness of healthcare systems thinking. Even individual, self-employed, one person operators are still part of a wider health care system. E-health is a way of reducing the inefficiencies of this cumbersome system, saving valuable resources, eliminating waste and reducing medical (iatrogenic) error.

An important part of attitude and mind set is, of course, education and training. When e-health initiatives are introduced, the users must be adequately trained.

Network effects

The foundations for e-health are largely in place, although there still remains much to be done. We can now begin to see network effects occurring.

It is like the early railroads in the United States. Each state used to use a different gauge of rail track causing shipments to be off loaded and then reloaded at each boarder crossing. Once a standard gauge was introduced commerce flourished because inefficiencies were reduced.

The same holds for the foundation structures I've mentioned. Once in place, the utility for every user is increased for each additional user that adopts the standard. This, in turn, encourages more users to adopt the standard. The effect is compounding.

There is, thus, potential for explosive growth in e-health.

Sustainable competitive advantage can sometimes be achieved by taking the bold and risky step of being a first mover and setting your own standard. This we've seen this in South Africa with the NAPPI drug codes for instance. This is also the reason that most of us use Microsoft Windows and Microsoft Word, even if we

hate Microsoft. This may be a risky tactic to attain competitive advantage, as there is only one winner, and many losers. You don't want to be like the betamax video recorder or 8 track tape player. It is probably a much better tactic to join the crowd, adopt the standards, leverage the network effects and create competitive advantage in other ways.

Characteristics of sustainable competitive advantage.

The foundations have set the stage for creating competitive advantage. The next question is what does it look like and where can it be found?

My suggestion is to analyse the characteristics of sustainable competitive advantage, each of us should look at our particular industry segment and apply a five forces analysis as proposed by Michael Porter, the management guru.

This identifies five forces buyers, suppliers, rivals, substitutes and new entrants. The relative strengths of these will determine the competitive landscape.

Some general thoughts are:

- **Buyers:** e-health has the potential to improve the value proposition for healthcare consumers. This means affecting one or more of the criteria of Time, Quality, and Cost.

Healthcare is a very high involvement product. Customers are very concerned about their own health. E-health is an ideal medium for shifting from a transaction-based to relationship-based product. I will shortly describe a patient intervention product where we did just this.

- **Rivals:** Differentiate yourself from the competition by emphasising your brand or reputation. As a communication medium e-health creates opportunity to do this. E-Health is also an ideal medium to reduce inefficiencies and reduce costs enabling you to achieve competitive advantage through cost reduction.
- **New Entrants and Substitutes:** Your power against substitutes and new entrants may come from adopting a pioneering and innovative culture, retaining the best staff, and emphasising your reputation.
- **Suppliers:** E-health can give competitive advantage through supplier integration, with resulting cost efficiencies.

Finding sustainable competitive advantage.

So we have described the characteristics of sustainable competitive advantage, we now need to know where to look for it.

I would like to propose that you consider looking for information asymmetries as a source of SCA. My argument is that the fundamental ability of information systems is the dissemination of information, therefore situations where information is unevenly distributed - information asymmetry - is a potential source for SCA.

The most obvious and striking example is the asymmetry of information that exists between the doctor and patient. The doctor knows a lot more about disease, its manifestations, management and the healthcare delivery system than does the patient. By supplying the patient with "intelligent" and customised information an organisation is able to empower patients. This creates value for patients and sustainable competitive advantage for the organisation.

As we examine the healthcare system we can see information asymmetries everywhere. Opportunities everywhere. Sustainable competitive advantage everywhere. This diagram describes just a few - I'm sure you can think of many others too.

The patient knows more about himself than the funder, and thus the funder cannot measure risk exposure as accurately as desired; The funder has a wealth of aggregate data , trends and patterns which are useful to providers; Brokers know little about a lot of funders; Patients know less about health funders than brokers; Medical Schools have a wealth of intellectual capital that providers may need; Providers know relatively little about suppliers and have difficulty in making fully informed purchasing decisions; Between initial care provider and referred provider an information gulf exists.

I would like to examine some of these and illustrate them with examples:

Patient < Provider

The obvious example here is the use of health information sites for patients. This has been one of the easiest and first points of attack in e-health. The dramatic rise in the number of these sites is staggering. Reports attest that a high percentage of internet users search for health related information. The classic examples are WebMD and DrKoop.com in the United States. The one I'm illustrating here is patient information pamphlet from a Doctors web site that I developed at MHS. The challenge now is to provide vetted, reliable, trustworthy information from credible sources. The work of HealthInsite through DHAC in this respect is noteworthy.

But what about other ways of reducing this asymmetry to provide SCA? How about allowing patients to measure their own health risk factors, customise diet plans, or access their medical records on-line in multiple languages while travelling? What about allowing patients to compare outcome statistics of surgeons or length of stay statistics for hospitalisation, thus empowering them to make informed choices and promoting competitive behaviour within the profession?

Another example of reversing this information asymmetry for SCA is with pro-active patient interventions. The example here is the reverse of a call centre. Instead of waiting for customers to call in with queries, we had a Durban based nursing-sister driven centre that would call and counsel high risk individuals on better health habits and more efficient ways of utilising their medical benefits. This would include information about where to obtain cheaper drugs, which were the specialised clinics for their condition and who to call if problems occur. This service was funded by the healthcare insurer as part of a preventative care strategy.

Funder > Provider

The first and core product that I created at MHS was simply to reverse the information asymmetry between funders (who have a lot of aggregate data) and supply this to providers. This took the form of practice profiling, by which providers can compare themselves against their peers in their region, association or nation wide. This comparison information is presented to doctors in an interactive web site (and also paper based for technophobes). Again, this service is paid for by healthcare insurers in the interests of inculcating cost effective practices.

A more detailed analysis is shown on the next slide. It shows a similar product which captures "clinical" knowledge in the form of rules and analyses claims. The result of the analysis is fed back through the web to a network of doctors who work with their peers and can address any issues that arise.

This type of information can empower providers too. They may now be confident about their participation in risk sharing arrangements and more innovative type of reimbursement mechanisms. An example of this is a new initiative where I was recently involved in the initial stages. This is a capitated specialist network developed by the Wits University Health Consortium (a private company dedicated to establishing a parallel teaching infrastructure in the private sector). Specialists will take responsibility for the total follow on health care spend including all hospitalisation and investigations. Central to this is monitoring information the likes of which I've just described, as well as information for specialists to control the flow of patients through hospital and investigation services.

To do this we formed a joint venture with a claims processing company to establish a pre-authorisation system and a clinical datawarehouse. Much work remains to bring this project to fruition, but the thirst for

such risk sharing arrangements is real, and the competitive advantage behind this only arises out of the disruption of the information asymmetry that exists between providers and funder.

Patient > Funder

The patient knows more about his or her history and health than does the insurer underwriting the health risk. Sustainable competitive advantage may exist, for example, if funders could better understand their risk and counter anti-selection.

An example recently developed by MHS is the health risk assessment program. This web based system allows patients to identify their risk factors for coronary heart disease. It also recommends lifestyle guidelines for diet, exercise and so on. Privacy and confidentiality notwithstanding, this type of product could supply funders with a quantifiable risk measurement tool as well as add value for patients.

Patient < Broker

Information asymmetry exists between brokers and patients too, strategic competitive advantage may be found by helping patients make informed choices.

Funder > Broker

Reducing transaction costs and simplifying the registration process may empower brokers to promote a funder's products.

Provider < Supplier

Reducing information asymmetry can empower providers to make informed purchase decisions about suppliers' products. This is the basis of the much talked about B2B public and private exchanges. These are on-line market places, either between trusted suppliers (in a private exchange) or a wider untrusted network of suppliers (in a public exchange). Here the source of sustainable competitive advantage is reducing transaction costs and reducing levels of working capital through just-in-time supply mechanisms.

Provider < Medical School

Another information asymmetry is between academia and practising clinicians. With the current trend of continuing professional development and the need for accreditation, interesting possibilities exist for sustainable competitive advantage in e-health. The example I'm showing is again from the Wits University Health Consortium. They have introduced a smart card system for monitoring CPD points. Great opportunities also exist for the use of the internet to provide on-line CPD.

Provider > Referee

Information asymmetry also exists between the provider and the colleagues to whom patients are referred. This is the area of electronic health records and teleradiology, telepathology, electronic referral notes and electronic laboratory results.

Now that we've defined the characteristics and know where to find competitive advantage, I'm going to hand you back to John who will talk about implementing e-health initiatives for competitive advantage.

Implementing e-health for competitive advantage.

John Mitchell

If e-health is to flourish in Australia, it needs to be staged and nurtured. We need to build on our own local skills and infrastructure, based on local demand.

The careful selection of solutions is important – we should only take the best from elsewhere. There are many initiatives, and only a few will survive. The successful ones will be built around SCAs, so we need to ensure that the SCA is clear.

A whole range of competencies is required for e-health initiatives. These include traditional management, strategic management, staff development, patient education and support as well as technology management. In addition to these traditional skills, e-health initiatives will require us to be able to evaluate e-commerce business models, to integrate back office and front office platforms and processes, understand supply chain management and customer relationship management, and identify the sustainable competitive advantages in e-health that we've covered in this presentation.

e-health in 2005: Sustaining the advantage.

So what will e-health look like in 2005? E-health will not be virtual: it will be an integral part of health organisations - bricks and clicks – and it will create more value for patient and provider and deepen relationships.

If e-health is implemented well it will change the delivery of health care, and efficiency of service. There will be a major impact on patients and staff. Patients will be more informed and empowered. Clinical service will be more consistent and less error prone due to new policies, guidelines and access to decision support where it is required.

We are likely to see mixtures of technologies to suit different situations. New funding models are likely to be developed.

In the end, we hope, patient care will be enhanced.

Conclusion

- We have begun on the road to e-health and have had some success.
- The foundations for e-health are largely in place and create potential for an explosive growth in e-health
- Build SCA around relationships, cost, quality and time advantages by understanding the five forces driving competition in your sector of the industry.
- Look for SCA where information asymmetry exists and exploit it.
- Build competencies for e-health today, and in particular find and retain skilled people.

Biographies

John Mitchell

John Mitchell, BA (Hons), Dip Ed, M Ed Admin, MBA, EdD (cand.), is the author of the Commonwealth's report on e-health, 'From Telehealth to E-health: the Unstoppable Rise of E-health'.

As a strategic planner in e-health and telehealth, John Mitchell & Associates provides strategic plans, business plans and feasibility studies for hospitals, health regions and State and Commonwealth Departments.

John Mitchell & Associates is Australia's most experienced project manager and evaluator of telehealth projects. Highlights include project management or evaluation of the following range of projects: renal telemedicine; telepsychiatry; women's and children's telehealth; Statewide teleradiology; nursing telehealth; aged care telemedicine; regional telemedicine; and telemedicine to the home.

As an evaluator and researcher in e-health, John Mitchell has had numerous papers published in the international Journal of Telemedicine and Telecare (UK), the Telemedicine Journal (USA) and Telemedicine Today (USA).

Dr Andrew Cottrill

Dr Cottrill qualified from the University of the Witwatersrand Medical School in 1986. He worked for five years in Primary health care and general practice in Johannesburg. He spent two and a half years in the Soweto Community Health Centres, during which time he was involved in the training of primary care nurses and edited a book on healthcare protocols. He had a passion for applying computers in healthcare and computerised the nurse-training record system. During his time doing general practice he became increasingly concerned about quality of care issues.

After travelling extensively in China and South East Asia he came to Australia and spent time in 1992 as casualty officer at Lithgow district hospital. He returned to South Africa and joined a Managed Health Care Company - MHS.

In his seven years with MHS he designed and developed computer based quality monitoring and managed care systems. He pioneered the first Provider Practice Profile system in South Africa. He developed the IT infrastructure for the company and was responsible for operations, new software development as well as research.

Dr Cottrill has a management qualification from the University of the Witwatersrand Business School as well as an MBA from the University of Cambridge, England.

Recently he has been involved with a healthcare market survey on behalf of Munich Reinsurance of Africa and helped them with developing their strategy as well as a business plan for a Joint Venture. He has also been instrumental in developing the IT strategy and alliances for a capitated specialist network project for the Wits University Health Consortium.

He has recently immigrated to Australia and is in the process of establishing his career here in e-health and health informatics.