Wireless Healthcare

Large Vendors In A Niche Market.

A number of the companies that grew rapidly during the dot com boom withered and died when the telecoms, media and technology bubble burst. Cisco and Oracle however, despite several rounds of cost cutting, remain key players in their respective markets. Nevertheless while cutting costs helps a company survive a market downturn it does not contribute to revenue growth. Even though the telecoms sector provided IT companies, such as Cisco, with impressive sales growth during the third quarter of 2003, this growth was from a low base. It will be some time before carriers and service providers order significant amounts of equipment.

Faced with sluggish growth in their traditional markets vendors turned their attention to fast growing niche markets. With governments spending heavily on healthcare in general, and healthcare related IT in particular, it was little surprise that one of these niche markets was ehealth. The vendor's marketing and investor relations departments started drawing the sort of aspirational growth charts not seen since the dot com boom. This report examines the assumptions vendors made about the ehealth market. Given that some of these assumptions have since proved incorrect, this report discusses ways companies can reposition themselves in what, despite all the media attention it attracts, remains a niche market.

This report also describes a typical wireless based ehealth service – remote blood sugar level monitoring - and uses this scenario to assess the strengths and weaknesses of the strategies adopted by major vendors who are active in the ehealth market.

At a Glance

Vendors built marketing strategies based on assumptions about the impact of an ageing population on the healthcare sectors. Some of these assumptions may be incorrect.

To meet strict performance targets health providers increase staffing levels rather than spend on IT.

Vendors with proven solutions and well-positioned products have benefited from increased spending on ehealth.

Some vendors are heavily exposed to any errors that can be traced back to their products.

While an ageing population may not place a significant burden on healthcare providers young people, afflicted by diet related illnesses, will. Vendors should develop products and services that address more than one sector of the ehealth market.

Elusive Growth.

Members of the baby boom generation, people born in the late 1940s and early 1950s, are approaching their late fifties and during the next three decades the elderly will make up a growing percentage of Europe's population. Not only will these senior citizens place huge demands on the healthcare sector but also, as the proportion of younger people of a working age declines, the labour pool from which health providers recruit staff will shrink. Faced with this dilemma governments will be forced to increase the efficiency of the healthcare sector by investing in advanced technology.

It was assumed health providers will be forced to invest in IT to help them deal with a growing number of elderly patients.

This indeed appeared to be the case, especially in the UK where the government drew up plans to increase spending on health, year on year, for five years. However funds flowed into National Health Service (NHS) faster than new IT services could be deployed. As well, funding was tied to strict targets that, given the time available, managers could only meet by recruiting additional staff. Technology vendors were also caught off guard and few had proven ehealth solutions to offer the NHS. Funding, which could have been used to purchase advanced healthcare technology, flowed out of the NHS as wages for additional administration and support staff. In the longer term this increase in staffing levels will make it more difficult to introduce new technology - especially products and services which automate manual tasks and displace workers.

Funds flowed into National Health Service faster than new IT services could be deployed.

Trust managers could only meet targets by recruiting additional staff.

Assumptions regarding the impact of an ageing population on the healthcare sector also proved to be incorrect (This subject is covered comprehensively in the Wireless Healthcare report - Care For The Aged - Long Term Problem Or Long Term Opportunity). People are living longer because, in general, they are healthier. The greatest burden people place on the health service is during the last year of their lives – and, as far as hospitals are concerned, the last few weeks of that year. The fact that people are living longer could actually postpone any increase in demand for healthcare services.

People are living longer because, in general, they are healthier. Longetivity could postpone peaks in demand older patients place on healthcare providers.

It is also widely believed that the population bulge, which has left Europe with a large number of people aged fifty and over, is unique. In fact there were two baby booms during the twentieth century. The First World War, and the flu epidemic that followed, held Europe's population growth in check for almost a decade. The birth rate then grew rapidly during the first years of the 1920s. People who made up this population bulge reached the age where they required increased healthcare during the 1990's. Companies who believe the NHS can be panicked into spending heavily on ehealth to deal with the healthcare needs of aging baby boomers will be disappointed. The UK's healthcare sector adapted to meet the demand from the first wave of baby boomers and sees no reason why it cannot cope with the second wave. As a consequence vendors encounter significant resistance as they attempt to sell ehealth solutions to healthcare providers.

There were two baby booms during the twentieth century. The first one impacted on the NHS during the 1990s

Cisco In The eHealth Market.

With the end of the telecoms boom came the end of Cisco's year on year double-digit revenue growth. Telecom operators had installed more optical fibre than customers required in the short to medium term. They also built data networks on the basis of Worldcom's claim that data transported across the Internet would double every three months. In reality bandwidth use was only doubling every twelve months. As well, advances in communications technology meant that this growth, and more, could easily be accommodated using existing network infrastructure. Vicious price-cutting drove a number of operators out of business and forced those left to reign in expenditure

Telecoms networks were built on the assumption that data transported across the Internet would double every three months. For the immediate future bandwidth demand can be satisfied with existing infrastructure.

With the telecoms industry awash with unused equipment Cisco has been attacking alternative markets - one of which is the public or government sector. Healthcare is of particular interest as attached to some application areas, particularly ehealth, is some of the glamour and growth potential of dot com services. The company's marketing department have produced a number of healthcare related television and magazine advertisements with messages that are accessible to both investors and customers.

Cisco regards the healthcare sector as a potential growth area.

The company has also supported advanced healthcare projects such as robotic surgery that, despite having few practical applications, grab the attention of the mass media.

Cisco has embraced claims that growing numbers of old people will force healthcare providers to deploy new technology. Already the company is quoting a 30% compound annual growth in public sector sales – a significant proportion of this coming from healthcare.

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However predictions of growth driven by demographic trends seem as misleading as Worldcom's debunked claims regarding projected demand for bandwidth. Most of the major healthcare related deals Cisco has closed in Europe are high bandwidth networks to support Voice over IP (VoIP) telephony. These networks could, in theory, support a range of ehealth applications but most are limited to providing features that are not unique to the healthcare market. VoIP is a technology you would expect any organisation, public or private sector, healthcare or non-healthcare related, to install when their existing telephone system becomes obsolete.

Networks Cisco have supplied to the healthcare sector could, in theory, support a range of ehealth applications but most are limited to providing features, such as VoIP, that are not unique to the healthcare market.

Oracle In The eHealth Market.

Perhaps more than any other database vendor Oracle's success has been tied to the growth of the Internet. The company's CEO Larry Ellison is an enthusiastic proponent of networked computing and, as was the case with Cisco, Oracle experienced a slowdown in sales when online services were scaled back or abandoned completely.

The company has developed a Healthcare Transaction Base (HTB) - an implementation of the Oracle 9i Database and 9i Application Server. The HTB is a platform developers can use to support a range of healthcare applications such as financial control, laboratory management and many of the processes requiring access to patient records and test results. The HTB is built around a healthcare information model and uses business process APIs.

Oracle’s Healthcare Transaction Base is a platform developers can use to support a range of healthcare applications.

A number of US based hospitals are already using the Oracle HTB to build order entry and patient record systems. Oracle themselves believe their HTB could be used to support a wireless e-prescribing system.

Oracle's approach to the healthcare market differs slightly from that of other mainstream IT vendors. By creating a sector specific product the company is able to market the HTB directly to end user organisations. By contrast, Microsoft is pushing a standard version of its Office XP product into the healthcare market by promoting the efforts of system integrators and OEMs.

By creating a sector specific product Oracle is able to market the HTB directly to end user organisations.

Olympus In The eHealth Market.

Unencumbered by the baggage of the dot com era and already possessing a strong presence in the medical equipment market Olympus was well placed to take advantage of extra funding government put into the healthcare sector. Through exclusive distributorships and partnerships with ehealth vendors the company has built a portfolio of products that it markets under the Osyris brand name. The company has already identified a need within hospitals for a fast and efficient means of correctly identifying a patient and ensuring any samples taken from that patient are tracked through various departments. Olympus has been able to leverage their knowledge of hospital laboratory systems and craft an elegant wireless based solution that is quick and simple to implement. Osyris includes software that Olympus claims reduces medical errors such as mislaid medical notes and mismatching of blood types.

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An eHealth Scenario

Here we describe a typical ehealth application and gauge the resilience of the three vendor’s marketing strategies within this scenario.

Some older patients who need to monitor their blood sugar levels use the Accu-Chek blood sugar monitoring device, manufactured by Roche Diagnostics. Younger people who, in light of increased awareness of diabetes, are concerned about their health are also purchasing the device.

Young people who, in light of increased awareness of diabetes, are concerned about their health purchase blood sugar monitoring devices.

In this scenario we assume that devices, such as the Accu-Chek are wireless enabled and the data they gather is automatically transferred to a central server for processing.

This scenario is compelling as the service would be applicable to both older people, who develop diabetes in later life, and a growing number of younger people who, through poor diet and lack of exercise, are suffering from the disease. The combined impact of both these groups on the workloads of GPs and clinicians could force the NHS to automate testing and monitoring of blood sugar levels.

The combined impact of both young and old patients on the workloads of GPs and clinicians could force the NHS to automate testing and monitoring of blood sugar levels.

At present approximately one million people are employed by the NHS – the UK's principle healthcare provider. Of this million 68% have direct contact with the patient. Wireless blood monitoring would not only reduce the workload of the 32% of staff employed in support and administration rolls but would also lighten the load on nurses and GPs who at present carry out tests and liase with patients – some of whom have blood sugar levels which are eventually found to be normal.

Wireless blood monitoring would reduce the workload of both the 32% of staff employed in support and administration and some of the 68% who have direct contact with the patient.

An automated blood sugar test supported by wireless technology would involve the patient using a lance to remove a drop of blood from their finger or arm. The lance that extracted the blood would also carry out the analysis. The results of the test would be transferred, automatically, over a network to a central server - preferably without the user needing to dial into the network or docking the device. Once on the server results would be added to the patient's electronic record – here they would be checked for anomalies. If the results fell outside preset limits the patient would be contacted, via an automated call system, and asked to repeat the test. If the second set of results confirmed that there was a potential problem an ebooking system would be used to arrange an appointment for the patient to see their GP.

Technology from the three vendors would support our wireless ehealth scenario. The use of technology from any one of these vendors would not exclude the use of products from the other two. However the success of Cisco, Oracle and Olympus in this scenario would be heavily dependent on the strategy each company adopted to address this niche market.

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Cisco And Automated Blood Sugar Monitoring.

The volume of data transmitted across a network during this scenario, or for that matter most other patient monitoring applications, is minimal. Unless an ehealth application uses video the capacity of the networks Cisco has sold to health providers will be under utilised for years to come. However patient monitoring does require a reliable and secure 'always on' connection. Our blood sugar testing system would benefit from a network that integrated voice and data functions. IP telephony would simplify the integration of patient data and voice response applications.

Unless an ehealth application uses video the capacity of the networks Cisco has sold to health providers will be under utilised for years to come.

However other network vendors are already selling into the healthcare sector and some have positioned themselves as specialists in ehealth applications. If the market grows rapidly there is no reason why Cisco cannot acquire one or more of these specialist network providers. However if the market grows slowly, or fragments rather than develops around a common platform, niche network vendors could, by striking up alliances with other IT companies, lock Cisco out of key sections of the market.

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Oracle And Automated Blood Sugar Monitoring.

Any healthcare provider planning to roll out an ehealth service will need to integrate that service with its existing back office operations. Even a 'next generation' provider, building their operation from scratch, will require middleware to link patient records systems to patient monitoring services.

In some respects Oracle is in a similar position to Cisco in that it has a large product of which only a small proportion is required to support a single ehealth service. On the other hand Oracle's HTB is a healthcare specific product with the potential to become a repository for ehealth expertise. Knowledge and application specific code developed for the blood sugar monitoring application could be retained, either by Oracle or by its applications developers, and would be available to health providers who purchased the HTB at a future date.

Oracle's HTB is a healthcare specific product and has the potential to become a repository for ehealth expertise.

It is, therefore, possible that Oracle's HTB will evolve in such a way that it keeps pace with the health provider's ehealth requirements.

However if ehealth remains a niche market, and blood sugar monitoring remains a one off stand-alone service, developers may be reluctant to invest in a large expensive platform to address such a specialised application. Oracle's HTB would then only be relevant to developers in the mainstream healthcare IT market – which itself has significant potential. However niche developers, who build their own middleware solutions into ehealth products and services, could limit Oracle's long-term growth in the healthcare sector.

If ehealth remains a niche market developers may be reluctant to invest in a large expensive platform to support stand-alone applications.

Olympus And Automated Blood Sugar Monitoring.

While Olympus itself is a large vendor and has a significant presence in the healthcare market its Osyris venture is relatively small. Olympus Osyris has, however, made a significant impact on the ehealth market and is a prime example of what a specialist vendor can achieve in a niche market. Rather than attacking on a broad front, the company has taken specialist ehealth applications and marketed them as tools for increasing efficiency and reducing errors. Olympus did not develop the technology from scratch but instead, acting as an OEM, used its strong position in the healthcare market to promote new ehealth services.

Osyris is a prime example of what a specialist vendor can achieve in a niche market.

Within our blood sugar testing scenario there is no reason why Olympus could not adapt technology it already has access to, or strike deals with other specialist medical technology providers. It could, with the experience gained working on blood tracking and patient monitoring applications build and end-to-end blood sugar testing service. However this strategy will only work while take up of ehealth services is slow. Rapid growth would see large vendors, with strategic products, define hardware and software platforms Olympus-Osyris would then be forced to use when deploying ehealth services. This would leave the company as a niche player competing with other specialist providers and forcing Olympus to firm up its relationship with its technology partners or run the risk of losing them to a major vendor.

Rapid growth would see large vendors, with strategic products, define hardware and software platforms Olympus-Osyris would then be forced to use when deploying ehealth services

Risks and Rewards For Vendors

In the short-term technology vendors could benefit from the media attention high profile ehealth applications attract especially applications that vendors claim reduce deaths through clinical errors and wrongly prescribed drugs. However, it is possible that medical errors, perhaps ones leading to the death or injury of a patient, could actually be caused by a failure of a vendors technology. Unless there is an application developer, or system integrator, between the vendor and the health provider the vendor will suffer any adverse publicity attracted by the failure of a product or service.

Using the elimination of medical errors as a selling point for an ehealth solution could prove to be a double-edged sword.

An example of the dangers faced by IT vendors is the fallout from the deployment of CAPSA - Cambridge University's troublesome administration system. Oracle became closely associated with the CAPSA system and while commercial organisations usually keep their IT problems out of the public domain organisations dependent on public funds cannot. The problems that Cambridge University experienced with CAPSA were widely reported by the trade and mainstream press with strong emphasis on Oracle's involvement within the project.

A vendor may suffer disproportionate damage if it becomes associated with a clinical error caused by a niche ehealth product or service.

Major IT problems which occur in the government sector are usually subject to public enquiries which tend to spread press coverage over months or, in some cases, years. An e-prescribing system that saves hundreds of lives a year is of passing interest to the IT and medical press. One that causes the death of a patient will receive a disproportionate amount of press and TV coverage and could both undermine faith in the service and reflect badly on the vendor who used the installation as a flagship application.

Large vendors should also consider what would happen if ehealth remains a niche market. If take up of ehealth services remains poor would the resources poured into healthcare specific products be better deployed in another part of the government sector?

If take up of ehealth services remains poor it may be better to redirect resources to an alternative public sector.

There are also a number of potential rewards for large vendors active in the ehealth market. While the NHS has, to date, been able to keep pace with the health requirements of the elderly it faces potential problems caused by the poor diet and sedentary lifestyles of young and middle aged people. Health problems relating to ageing are well known and most health providers are skilled at dealing with them. An increase in the number of people suffering from obesity related illnesses is a relatively new phenomenon and there are fewer mechanisms in place to deal with them. Here there is an opportunity for a vendor who can automate treatment and monitoring - allowing a healthcare provider to cap the costs of dealing with diseases such as diabetes. Once this niche ehealth application has been fully developed the vendor will be well placed to build a broader presence in the healthcare market by automating a range of clinical processes the provider is currently carrying out manually

There is an opportunity for a vendor who can automate treatment and monitoring. Once this niche ehealth application has been fully developed the vendor will be well placed to build a broader presence within the healthcare market.

Conclusions

A number of vendors have built their ehealth marketing strategies on assumptions about the impact of an ageing population on the healthcare sector. However some of these assumptions may prove as misleading as the claim made by WorldCom, during the dot com boom, that demand for IP network bandwidth would double every three months.

During the 1990s the NHS factored in the impact of an increasing number of elderly patients. It feels it can cope with a second wave of elderly patients.

Vendors hoping additional government spending on healthcare would lead to an increased demand for ehealth services have been disappointed as a large amount of funding has been used to recruit additional staff rather than automate clinical processes.

The IT vendors benefiting from extra healthcare funding are those with applications that are both proven and relatively simple to implement. Vendors with stand-alone wireless products have a key advantage here.

It is possible that some medical errors, perhaps leading to the death of the patient, will be caused by a failure of the vendor's technology. An ehealth system that save hundreds of lives a year is of passing interest to the IT and medical press. One that causes the death of a patient will receive a great deal of mainstream press and TV coverage and could reflect badly on the vendor who used it as a flagship application.

Vendors should not be put off by initial setbacks in the ehealth market. Over the next two decades the healthcare sector will have to deal with an increasing number of young people with diet related illnesses. Healthcare providers will be forced to automate an increasing number of clinical processes. It is important therefore that vendors do not put too greater emphasis on applications designed exclusively for elderly patients.

Vendors based marketing strategies on assumptions about the impact of an ageing population on the healthcare sectors. Some of these assumptions have proved to be incorrect.

To meet strict performance targets health providers increase staffing levels rather than spend on IT.

Vendors with proven solutions and well-positioned products have benefited from increased spending on ehealth.

Some vendors are heavily exposed to any errors that can be traced back to their products.

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Vendor Profiles

Cisco

As both incumbent and next generation telecoms operators raced to install as much data networking capacity as possible Cisco became one of the world's most high profile equipment providers. The company's sales rose from $12.2 billion in 1999 to $18.9 billion in 2000, when it reported earnings of $2.7 billion. In 2001 Cisco reported a loss of $1 billion on sales of $22.3 billion. It is predicting earnings of $3.6 billion in 2003 and the company exceeded its earnings and sales targets for Q3 of 2003 – however even with quarterly sales of $5.1 billion it has some way to go to regain the momentum it achieved during the dot com era.

Cisco has no health sector specific product but points to a number of implementations of its AVVID (Architecture for Voice, Video and Integrated Data) technology in hospitals throughout the UK and Europe. Working with BT, Cisco has installed a converged network based on AVVID technology at Central Lancashire and Flyde Coast NHS Communities. In conjunction with Cable and Wireless Cisco has installed a similar IP network for Kent Surrey and Sussex Workforce Development Confederation.

To date Cisco's healthcare related installations have majored on IP telephony although the company describes these networks as 'future proof' or 'future ready' and claims they are designed to handle advanced ehealth applications. These networks will only reach their full potential when a range of other ehealth services such as e-prescibing, TelePACs and patient monitoring are in place.

Cisco At A Glance

Founded in 1984

37,000 employees.

Achieved sales of $22.3 billion during 2001 but lost $1 billion in the same period. Has forecast earnings of $3.6 billion during 2003 and achieved sales of $5.1 billion during Q3 of 2003.

Sales to health providers tend to major on VoIP applications rather than networked clinical processes.

www.cisco.com

Analysis

With sales flat for the last two years Cisco's profit growth has been achieved by radical cost cutting. Investors may be happy with this in the short term but in the medium to long term they will be looking for a significant improvement in sales. The attraction of the healthcare and ehealth market is that, potentially, it could provide rapid growth. Cisco expects to show a compound annual growth of 30% for sales to the public sector up until 2007. A danger for Cisco is that the healthcare market may smoulder, rather than catch fire, providing a level playing field for large and small network vendors alike. More than other large vendors Cisco is particularly vulnerable as it does not have a specific ehealth or a healthcare product.

Oracle

For the last two years Oracle's sales have remained flat. The company turned over $2 billion for the first three quarters of 2002 and achieved a similar figure during 2003. Costs have also remain flat and the company's earning growth, $343 million to $440 million, is mainly down to the fact that Oracle's investments have stopped losing the company money.

Repackaging and enhancing its 9i technology to look like a healthcare specific product has enabled Oracle and its industry partners to present themselves to the healthcare market as healthcare IT specialists. The Trading Community Architecture (TCA), that was used as an engine for web based online stores and market places, has formed the basis of the Enterprise Master Person Index (EMPI). The EMPI includes the API and data structures developers would use to manage electronic patient records.

Oracle's Healthcare Transaction Base (HTB) is supplied to the healthcare provider either by an applications developer or by Oracle itself. The HTB provides the middleware new information services need to gain access to data stored in legacy systems.

Oracle states that it does not develop healthcare applications itself but merely provides the HTB as a vehicle developers use to deliver healthcare applications. In the US the company has created what it terms a 'Customer Advisory Board' to provide guidance in the development and implementation the HTB.

In Europe Oracle has partnerships with CSC Scandihealth and Finsiel. However, in the UK, Cardiff and Vale NHS Trust's own developers are using Oracle's HTB to build a 'Results Review Reporting Application' which gives physicians real-time access to patient information through a web interface.

Oracle At A Glance

Founded in 1977.

40,000 employees.

Annual sales of $2 billion with earnings of $400 million during the first three quarters of 2003 (2002 $343 million).

Is using experience gained during the dot com era, in areas such as trading community architecture, to develop a product that can be used to manage patient records.

Oracle is marketing its Healthcare Transaction Base as a platform for a range of healthcare applications.

www.oracle.com

Analysis

To support developers working in the healthcare sector, Oracle has adapted some the technology and processes used by dot com companies and online retailers. This simplifies the deployment of the company's database in areas such as patient management and provides Oracle with a higher profile within the healthcare sector.

The slow pace at which IT is being rolled out in the healthcare sector – especially in areas such as e-prescribing and electronic patient records – must be disappointing for a company such as Oracle that grew rapidly during the dot com era. In some cases, rather than wait for an independent software developer to implement a solution, Oracle is working directly with the healthcare provider. This may speed up development in key areas – such as ehealth – and provide valuable reference sites for Oracle's HTB. However there is the danger that the company becomes closely associated with any problems connected with a badly implemented solution.

Oracle will, in the medium term, benefit from demand for middleware to link legacy systems to new ehealth services. Once established in this niche market Oracle's HTB could become the platform of choice for companies developing online medical services.

Olympus

Well known for its range of cameras, Olympus is also the world's largest manufacturer of microscopes. In 1985 the company took over marketing of microscopes in the UK from Gallenkamp and four years later set up a diagnostic division. In August of 2002 Olympus formed an alliance with Sybermedica that enabled it to supply dermatology and e-referral systems. A month later the company became an exclusive distributor for Datalog and began marketing Datalog's tracking product - which had already been available in the UK for 12 months - under the Osyris brand name.

Based on wireless network technology Osyris uses two-dimensional barcodes on wristbands and ID badges to keep track of treatment and services – such as blood transfusions and radiology – that are provided at the point of care. Olympus claim Osyris measurably improves processes and the safety of patients within the primary and secondary healthcare sectors.

Olympus At A Glance

Founded in 1919

5223 employees in the UK.

Profit 2002-3 – $202 million

Revenue 2002-3 $4.7 billion

Launched the Osyris product range in the UK in August 2002. Has installed ehealth systems in 70 hospitals – 12 of these systems are based on wireless technology.

www.olympus.com

Osyris systems have been deployed in 70 hospitals throughout the UK – 12 of these systems employ wireless networking. An e-referral system is used at The Royal Wolverhampton Hospitals NHS Trust and Morriston Hospital in Swansea has deployed an Osyris blood tracking system. Queen Elizabeth Hospital in Gateshead use an Osyris system based on wireless PDAs.

Olympus has reported steady sales growth over the past three years with turnover growing from $4.4 billion in 2002 to $4.7 billion in 2003 during the same period net income grew from $85 million to $202 million.

Analysis

While Olympus is a large company it is still a relatively small player in the ehealth market. This should not be a problem while ehealth remains a niche market. However if the market grows rapidly Olympus may need to move away from the distribution of other vendor's products and start, instead, to develop its own solutions. The company has already restructured its life sciences division to meet a growing demand for biotechnology related equipment and services. At some point a similar reorganisation may be required in the equipment division.

When launching the Osyris product range Olympus made great use of data relating to the number of deaths and injuries caused by conventional medical systems. When the ehealth market matures – and a number of patients still die through medical errors – the company will need to ensure that what was once a positive marketing point does not become a negative.

Olympus has successfully used its position as a major supplier of medical equipment to gain a foothold in the ehealth market. Building on this early lead will depend on how well the company can either develop Osyris in house or enhance it using ehealth solutions from other vendors.

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