Tell Me Where It Hurts:

A Check-Up of Health Care Business Needs of Small- and Medium-Sized Enterprises

March 13, 2002

Proceedings

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Executive Summary

On March 13th, 2002, the Silicon Valley World Internet Center convened a Think Tank Session to create a body of knowledge around the most critical technology pressure points of health care organizations (HCOs). The group examined how information technology professionals can better harness computing to improve business strategies for SMEs (small and medium-sized enterprises) in the health care industry. Session participants focused on the needs of different constituencies interfacing within the health care space – HCOs, system integrators (SIs) and independent software vendors (ISVs). Companies and organizations represented in this Think Tank Session included: Aquave Group LLC; Bio Essential Nutriceuticals; Exodus, a Cable & Wireless Company; Caldera International; Client Services Group; ePhysician; El Camino Hospital; Fujitsu Software; GeneticXChange; Mitem Company; Quovadx; The Real-Time Enterprise Group; SilverStream Software; Simulsync Corporation; Stanford Medical Center; and Stanford SKOLAR MD.

Despite the fact that over the last quarter century, computing has advanced by leaps and bounds, the management of health care organizations is plagued with challenges that continue to increase. Integration and inter-operability, information duplications and medical errors account for a large part of buisness inefficiencies found today in HCOs. Limited revenue, increasing costs, continued provider and consumer dissatisfaction with health care financing and delivery, and an uncertain financial environment have led boards of directors and shareholders of HCOs to be more demanding that IT investments deliver adequate business value. The Health Insurance Portability and Accountability Act (HIPAA) regulations of 2001 place additional pressures on HCOs to embrace the Internet economy. But on the technology side, proprietary systems have led to the creation of what are now isolated islands of applications and information, and businesses are held prisoner on these islands. Rather than allowing business strategy to drive information technology and systems' needs, complex and expensive information technology and systems are now driving business. A need for affordable, simple systems has emerged among SMEs – systems that would allow such businesses to migrate from mere communications to full collaboration.

This Think Tank Session attempted to delineate the major pain points currently faced by SMEs in the health care industry. Participants' main thrust was to identify such pain points from the perspective of the health care provider. Six major areas of pain among providers were identified. All six issues were recognized as being top-of-mind.

First, a significant proportion of problems are associated with data in one way or another and span issues ranging from security to data access and portability to system interoperability to drug knowledge management to dissemination. Second, providers are known to be lacking in even basic technical infrastructure, a problem that is exacerbated by the diversity and fragmentation of deployed information technology systems. Third, the industry is in dire need of a system-wide process that would allow for the definition and standardization of business processes. Fourth, participants agreed that at this point in time it is still notoriously difficult to arrive at a clear justification for expenditures and a lucid model of ROI, without which it is rather hard to drive investment and adoption. Fifth, a severe lack of education, communication and collaboration plagues the industry and must be bridged in order to ensure the success of any initiative. And sixth, compliance with HIPAA continues to present a challenge that the entire industry must rise up to meet by January 1, 2003.

These six areas of pain impart a slew of ongoing challenges to the industry. While participants on the whole were optimistic as to the eventual alleviation of these challenges, the complete resolution of such issues was seen as being a longer-term process that will extend well into 2005 and beyond.

Introduction

Over the last quarter century, computing has advanced by leaps and bounds. As recently as 1977, the president of Digital Equipment Corporation said, "There is no reason anyone would want a computer in their home." And it was only in 1981 that Bill Gates commented, "640k ought to be enough for anybody." At the dawn of the 21st century, computers are ubiquitous, and memory, processing power and bandwidth are no longer constraints. To our great delight, the industry pundits were wrong. We now have an opportunity to harness this phenomenal power for the good of mankind – but are we doing our best?

On March 13th, 2002, the Silicon Valley World Internet Center convened a Think Tank Session to examine how information technology professionals can better harness computing to improve business processes in the health care industry, with a specific focus on SMEs – small and medium-sized enterprises.

Appropriately, Think Tank Session participants focused on the needs of the different constituencies interfacing with eBusiness implementations within the health care space – health care organizations (HCOs), system integrators (SIs) and independent software vendors (ISVs). All three groups were represented at the Session. These proceedings summarize that session, providing a clear view of how experts in this space construe the industry's needs in both the short- and in the longer terms.

Companies and organizations represented in this Think Tank Session included: Aquave Group LLC; Bio Essential Nutriceuticals; Exodus, a Cable & Wireless Company; Caldera International; Client Services Group; ePhysician; El Camino Hospital; Fujitsu Software; GeneticXChange; Mitem Company; Quovadx; The Real-Time Enterprise Group; SilverStream Software; Simulsync Corporation; Stanford Medica Center; and Stanford SKOLAR MD.

From Communication to Collaboration

A couple of decades ago, processing was slow and expensive and there were serious technological constraints on the electronic usage of data. Visionaries dreamt of days when processing would be infinite and free. Today, MIPs (millions of instructions per second, a measure of computing power) are infinite for all practical purposes, and quite inexpensive. Bandwidth was a real constraint, as well – but lately, talk has centered more on the issues inherent in overcapacity and how such capacity can be put to better use.

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So now, as we embark on the third millennium, we have at our disposal all of the memory, the processing power and the bandwidth we could ever need. Paradoxically, the evolution of information technology and systems over the last quarter century has placed unforeseen obstacles in our path. Proprietary systems have led to the creation of isolated islands of applications and information, and businesses are held prisoner on these islands. Adopting new systems that would allow us to interconnect and communicate in the way we envision is extremely costly. Worse still, adoption of such new systems typically brings about a major transformation in the way our businesses function and in the way our employees perform their day-to-day tasks. Such systems are becoming increasingly complex and expensive, and few outside of the largest organizations can afford to implement them. As a result, a need has developed among SMEs – a need for affordable, simple systems that allow businesses to graduate from simple communications to collaboration. Clearly, if such systems are to take root among SMEs, they must be based on universally

accepted standards. Internally, new systems must integrate with existing systems and be built around processes, and they must adapt to the organization's workflow. Externally, such new systems need to leverage the Web. Until now, migrating business processes to the Web has been an uneven process at best. eBusiness has not been an urgent and pressing need for organizations, budgets have not allowed for all-out eBusiness adoption, and thus far companies which had remained on the sidelines have had better ROI (Return on Investment) than companies that have jumped into the technology-adoption fray. Universally, in order to achieve true "democratization" of information technology, these new systems must be inexpensive, efficient and simple-to-use. Understanding the needs of SMEs requires that information technology vendors work with them to understand their real needs.

Challenging Pain Points in Health Care – Constituents' Perspectives

Think Tank Session participants were asked to articulate their most challenging pain points over the next six to 12 months. They were also asked to consider such pain points from the perspective of all relevant constituents – HCOs, SIs, and ISVs. The complete results are presented here as Appendix I.

Participants then broke into groups representing the three constituencies. Each group identified the five pain points most critical to them. They developed pros and cons for each pain point. The following elaborates on these critical short-term pain points in the context of each of the three constituent group's needs and perspective.

Health Care Organizations (HCOs)

HCOs emphasized the following five areas as top short-term pain points, ranked from most- to least-important as follows:

- Access and portability of patient information
- ROI metrics for technology investment
- Charge capture
- Fragmentation of the Web infrastructure and the information technology marketplace, and –
- Drug knowledge management and dissemination

HCOs would like to avail their patients of easy and efficient access to their own medical data and information. They would also like to make that information more portable through a technology-based process that facilitates the transfer of patient medical information from one provider to another without the patient or end-user having to submit the exact same information repeatedly to different providers. This process should also speed up and improve the ease with which a patient's personal medical file traverses the health care bureaucracy. Such easy and efficient access to medical records will improve both quality of service (QoS) and quality of care; it will create loyalty and trust between the provider, the physicians and patients as the number of diagnostic errors decreases and patient confidence increases; and it will facilitate internal efficiencies and save money. However, the providers' hesitancy to adopt such a system wholeheartedly stemmed from a fear that documents and information could be lost, and that physicians, residents and patients uncomfortable with having personal medical information in the ubiquitous system would go elsewhere for health care services.

ROI metrics are extremely important to HCOs and painfully absent from the current environment. Ed Gardner, Web Center Director for the Stanford Medical Center, explained that he is currently on 18 different hospital and clinic committees, and that prior to undertaking any IT investment – especially in the current economic environment – the first question he is confronted with is, "How is it going to pay off?" Software vendors and system integrators must therefore be capable of providing HCOs with objective metrics that are grounded in actual case studies. In the presence of such metrics, it is far easier to secure budget dollars, and time to market can be accelerated. Further, the HCO gains the opportunity

to better the institution's industry-facing ranking and prestige. Since the most prestigious institutions typically receive more and larger grants, better rankings have an immediate impact on the receipt of research-targeted funds from government, philanthropists and research organizations. In addition, the institution's ability to attract and retain human capital improves significantly.

Charge capture is the process by which procedures and medication extended to patients are recorded, coded, priced and billed. Automating charge capture allows medical staff to spend more time with patients rather than on paperwork. Such automation also shortens the time that it takes a provider to issue an invoice, accelerating the patient's payment and increasing provider cash flow for patient-oriented purchases and investments. Today, the charge capture process is routinely held hostage to four or five different systems that do not communicate with one another. But not all participants felt comfortable with full automation of the charge capture process. Some feared that automation will be extremely complex, and that the process has the potential to take time away from patients, with an associated degeneration in patient quality of care.

HCOs were concerned about the inherent fragmentation of the information technology market. Gardner remarked that he uses approximately 30 products and services to build and run his hospitals' Web sites, and that does not include back-end knowledge management applications, personalization engines, or network management software. Even a solid consumer portal without the complexities of more interactive portals requires products from 15 to 16 different companies. This comes on top of the multitude of sub-systems that are required in order to run a hospital. Proponents claimed that by ridding the industry of some of this fragmentation and providing HCOs with integrated systems, they can achieve economies of scale within their departments. The result will be a clearer ROI argument to take to hospital management. Such consolidation could accelerate the adoption of new information technologies in the industry.

Finally, HCOs expressed a need for drug knowledge management and dissemination systems. Such systems could assist in educating physicians about clinical trial results. In real-time, however, KM (Knowledge Management) will decrease medical errors and improve the accuracy and timeliness of medical prescriptions. The physician will immediately be able to view proper dosage, drug efficacy and possible interactions, improving the quality of care provided to patients. Such a system will also provide the HCO with extensive opportunities for data mining, as well as with increased ROI for the drug sales effort.

System Integrators (SIs)

The top five pain points for system integrators were as follows:

- HIPAA (Health Insurance Portability and Accountability Act) enforcement and regulation
- Fragmented and disjointed data
- Lack of consistency and efficiency in process management
- Security
- Lack of consistency in user experience

System integrators (SIs) ranked enforcement and regulation relating to HIPAA as their highest priority pain point in the short term. Passed by congress in 1996, HIPAA mandates far-reaching changes in the legal and regulatory environments governing the provision of health care. Such changes will impact the health benefits, the delivery and payment of health care services, and the security and confidentiality of health-related information that is of a personal nature. HIPAA regulation touches on the integration of many processes, and system integrators' concerns relating to HIPAA spanned the other four pain points elaborated on below – data, processes, privacy and the end-user's experience.

SIs' second-highest ranked pain point was data. More

specifically, the SIs lamented the fragmented and disjointed nature of data in the health care industry. By definition, and for good reason, health care-related data is silo-ed off in order to preserve patient confidentiality. Unfortunately, this practice hampers the free flow of information and provides an integration challenge that is far greater than that observed in other industries. The industry is lacking in the very architecture that would enable seamless communication between systems. This challenge is exacerbated by the lack of standards in this industry. In turn, disparate systems' inability to communicate is the root cause of many other information technology related problems plaguing health care. As Jeff Edwards of GeneticXchange commented, "At the end of the day we make bad decisions because we do not have good information."

SIs third concern was with the character of process in the industry. Much of health care record keeping is still manual and paper-based; most of the data, therefore, is not in digitized form. It must be said that integration and capture of non-digitized data look to be daunting tasks. Even where processes for digitization exist, they are inconsistent at best. In addition, SIs perception is that change management in the industry is inadequate. As a result, change is slow to take hold even where attempts are made to initiate it. The result is that medical errors due to lack of information occur frequently, leading to inefficient clinical decision-making processes and poor quality of care. The SIs suggested that certain functions, e.g., prescription, should be automated throughout the health care pipeline from start to finish.

The fourth pain point raised by SIs was that of security. According to participants, security is a by-product of the enforcement of privacy. From the SI's perspective, systems integrators are challenged by security issues, while HCOs and their customers and consumers are challenged by privacy. Among concerns raised were the reliability and possible abuse of data that could lead to errors in clinical decision-making processes, as well as the confidentiality of patient data.

The fifth pain point for SIs was the lack of consistency in the user's experience. From the perspective of the patient, such inconsistencies, stemming from the relatively large number of systems that end-users are exposed to, lead to confusion, inefficiencies and a perceived poor level of service. However, physicians themselves are put off by the constant need to keep up with evolving information systems in all of their various incarnations. Faced with such inconsistencies, and with a multiplicity of user interfaces, physicians choose to forego the use of such systems completely. As a result, they lack information that they should be able to easily obtain through electronic systems. Physicians are then forced to rely on drug sales representatives who keep them up-to-date through a process known in the industry as detailing. At the end of the day, medication is often purchased based on the strength of the physician's relationship with a sales agent rather than as a result of the rigorous review and analysis of clinical data.

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Independent Software Vendors (ISVs)

Independent software vendors' (ISVs) top five pain points were as follows:

- End-users' unrealistic expectations from systems
- A lack of technological infrastructure in the industry
- Interoperability challenges
- The value proposition
- Security

The most troubling point for ISVs was the unrealistic level of expectations set by system end-users. According

to the ISVs, health care end-users are demanding all-in-one solutions. However, the health care industry is so segmented and fragmented that software developers view the creation of a single, seamlessly integrated all-in-one solution to be an impossibility. ISVs claimed that no single software vendor could ever hope to support the diversity of solutions an HCO needs. They clamor for more feedback from providers and end-users and suggested that an independent, unbiased consortium of HCOs be set up to address this need.

The lack of technical infrastructure, especially pronounced among SMEs, was the second most pressing pain point proposed by ISVs. Often, SMEs in the health care industry lack even the most basic technical infrastructure requirements such as high-bandwidth Internet connectivity and local area networks (LANs).

ISVs' third pain point was the high level of potential inter-operability and the challenges posed by trying to interconnect point solutions, legacy systems, home-grown applications and incompatible or outdated hardware. This mishmash of software and systems severely handicaps ISVs' ability to continue to support previous releases over the long term. Ironically, this inability creates additional inter-operability issues with which the entire industry must contend - along with the ISVs.

ISVs were concerned about their own inability to define a powerful and well-articulated value proposition for SMEs in the health care space. This inability stems from the complexity of the health care industry. The health care vertical is different from every other by virtue of the multiplicity of levels and users within the industry, the many degrees of specialization and the vastness of a sector that accounts for 15 percent of gross domestic product and will grow to record revenues of approximately $1.5 trillion in 2002. Unable to leverage effective value propositions, smaller ISVs are left with little access and opportunity as providers opt for the safety of large, well-known brands that impart trust and confidence. Such larger more diversified information technology vendors frequently lock in customers through less efficient, proprietary solutions, where smaller ISVs typically promote open and more efficient, standards-based systems. ISVs implied that at the end of the day, everyone except for the large IT vendor loses.

Finally, ISVs raised the issue of security as one of their major pain points. Security is critical in health care because unlike the banking or financial industries, it is not just financial or other confidential information that is at risk – it is the very lives of patients that may be compromised. Security breaches or mis-information can impact mortality as well as quality of service. According to the ISVs present at the Think Tank Session, current technologies such as XML, SOAP and UDDI have not matured enough to address and support such concerns. The ISVs suggested that information technology companies need to address such security issues as an industry, and not on their own.

Challenging Pain Points in Health care – The Industry-Wide View

Following presentations by each of the three constituent groups, Session participants distilled the commonalities and identified which of the top pain points of each group were relevant to the industry as a whole. Participants zeroed in on six major issues: data; lack of infrastructure; defined business processes; justification of investment; lack of consumer education, communication and collaboration; and HIPAA. For each of these issues, participants expanded on specific business-related issues, mediating factors and pertinent issue-specific challenges that they expect to contend with over the next six to 12 months.

Data Issues

Data was defined as encompassing not only data, per se, but also issues relating to security, access and portability of patient data, interoperability of systems, and drug knowledge management and dissemination.

Participants thought the insurance industry could facilitate the adoption of solutions relating to data issues across the entire industry, since they can drive the use of standard forms and terminology, reimbursement by insurance companies being a motivating factor. Several other mediating factors included the development of common access points; development of semantics (standards); investment in infrastructure; and the development of secure, cross-platform voice- and handwriting-recognition technologies.

In the short-term, participants identified many challenges related to data issues. Such issues included the ability to migrate data efficiently and effectively; industry-wide agreement on data standards; data accuracy and reliability; universal access to data; security and privacy; the scalability of storage and networks as data volume continues to grow; user agreement on permissions across relevant constituents – physicians, patients, public, health care staff and administration; and insurance company agreement on standards for compliance and reimbursement.

Lack of Infrastructure

The lack of infrastructure among HCOs begins internally with a simple deficiency in information technology systems and the knowledge requisite to acquire, install, run and maintain such systems. Externally, this lack of infrastructure is exacerbated by the fragmentation of information-technology solutions geared for the Web in general, as well as those developed for the health care industry specifically. As a result, users of health care systems are confronted by a complete lack of consistency at the application level.

Mediation of these issues is thought to be primarily a function of resources – participants believe that with more dollars allocated to information technology many of these issues can be resolved. Other mediating factors included education – providing health care IT and administrative staff with the knowledge necessary to understand and solve the problems with which they are confronted; access – especially among SMEs and smaller providers who cannot afford sophisticated solutions due to a lack of economies of scale; and infrastructure. Participants believed that HIPAA will be a prime driver in resolving many of these issues as organizations are forced to comply. Compliance will necessitate the investment of resources and the provision of access and education.

Short-term challenges in this realm included the existing fragmentation; a scarcity of domain experts within the industry; an ingrained resistance to change that is partially driven by IT's reluctance to part with legacy systems (exists in every industry but is thought to be more prevalent in health care); and the time and resources necessary to develop out-of-the-box portals specifically modeled after the needs of HCOs.

Defined Business Processes

The need for defined business processes was seen as another major meta-issue with which the entire industry must cope. Participants singled out the end-user charge capture process as especially complex and critical. "Process" in this context was agreed to encompass everything discussed by the SIs and included under process management above.

The solution to the business processes problem will have to evolve along a clearly defined path. Participants also thought that the business processes in and of themselves could do double-duty as mediating factors. However, this would require the same kind of solid value propositioning that is absent across the entire industry. Once the value proposition is in place, advantages such as cost savings and reduced latency would become evident. When procedures for digitization of data are in place and systems are made more accessible, computers will be enlisted more often in the effort to improve processes. Participants also mentioned the adoption of clinical guidelines and best practices as additional medi-

ating factors; this is to be expected as such moves would be tantamount to standardization.

Short-term challenges in the context of business processes included resistance to change, a lack of leadership willing to take on and support information-technology-relevant causes and a lack of informed and supportive top management.

Justification of Investment and ROI

Justification of invetstment in IT and ROI (Return On Investment) are clearly major pain points for the health care industry. The two outstanding issues were the need for metrics that would enable the lucid communication of ROI as it relates to the adoption of technology in the industry, and the need for a clear and well-defined value proposition.

Participants thought that, first and foremost, mediation would be driven by the emergence of early adopters that would be willing to partner with technology vendors to establish a baseline for initial ROI studies. Providers, however, were concerned about the sales-driven thinking that motivates most technology vendors. Stanford's Gardner opined, "Most people are coming in to sell something. We need people to come in and help us define the vision." Gardner has found that many IT companies are not willing to make the sacrifices necessary to penetrate the health care market. From the HCOs' point of view, however, information technology managers are in no position to buy systems on faith; the health care industry is littered with the corpses of once promising young IT companies. HCOs need to see clear, proven ROI if they are to come forward with investments, while technology vendors (both SIs and ISVs) desire more collaboration with providers. This impasse must be resolved if these two industries are to move forward together.

ROI in this context was defined as encompassing more than just money. Participants expressed a need for the "totality of the value proposition for the players involved." Providers claimed that there are more nuances to the extent and scope of benefits in the health care environment than there would be in a typical corporate environment. Not everything in health care can be quantified directly, and definitely not in dollar terms. At the end of the day, there is a patient who wants nothing more than to be healthy or to just stay alive. This provides a challenge to creating relevant metrics for the industry.

Additional challenges included a lack of human resources to allow constituents to work on metrics and expenditure justification, a lack of access to end-users on the part of technology vendors, the prevalence of a sales approach versus the desired marketing approach which providers crave, and the prevailing notion that early adoption of technology on the part of providers results in missed opportunities elsewhere.

Lack of Education, Communication and Collaboration

Participants believed that a lack of education, effective communications and collaboration were the primary drivers leading to the unrealistic expectations developed by end users. Participants believed that increased educational efforts, better communications and collaboration on the part of the independent software vendors will enlighten and inform end users. In addition, they recommended the creation of a consortium of end-users and important industry players.. Such a group would convene on a regular basis and initiate activities that would bridge this education, communication and collaboration gap. Participants thought that challenges to success in this arena would come from a lack of resources, industry constituents' competing agenda and interests, as well as from a lack of sufficient interest and commitment on the part of constituents to begin with.

HIPAA

HIPAA was seen as being self-explanatory. Think Tank Session participants believed that nothing short of government enforcement would drive HIPAA forward and could think of no additional mediating factors in this regard. Participants did not think that HIPAA would have a substantive effect on internal industry intranets. It also would not impact HCOs' consumer portals. However, they thought HIPAA would have a major impact on the degree to which different HCOs share information. HIPAA compliance was seen as being challenged mainly by a lack of fiscal resources and the need for education relating to the Act's requirements. While monitoring and penalties are expected to keep compliance on track, participants remarked that HIPAA will always be viewed as an imposition, and that at some level compliance and monitoring problems would persist

SME Health care Business Needs – A Long Term Forecast

Participants were asked to predict when they believed the various issues raised as high-priority pain points would be resolved. The group agreed that by the end of 2002, metrics that will facilitate benchmarking and ROI studies would be widely available. As a point of reference, 2003 was mentioned as the deadline for compliance with HIPAA regulations. Beyond 2003, the consensus was that data accessibility related issues would be resolved first, followed by standardization a year or so later (into 2005). Critical mass would be reached approximately one year later.

Conclusion

Few business sectors are as complex and problematic as the health care industry. The very size and complexity of health care lends itself to the creation of problems of a scope and extent unknown elsewhere. Nevertheless, two-dozen Think Tank Session participants from diverse backgrounds and organizations managed to come to a consensus on the industry's most urgent pain points. These six major issues consist of problems associated with data; a lack of technical infrastructure; the scarcity of defined business processes; a difficulty in arriving at a clear justification for IT investment and the lack of a lucid model of ROI; a severe paucity of education, communication and collaboration across the industry; and last, but far from least, HIPAA. However, while all of these issues are top-of-mind and are being dealt with to one extent or another, the complete resolution of such issues is a longer-term process that extends well into 2005 and beyond.

Suggestions for Future Think Tank Sessions

Think Tank Session participants suggested the following topics for future Sessions –

- Data access for drug discovery
- Impact of science on Medicine/Health care
- Optimization of health care industry supply chain management
- The health care customer experience
- PDA and wireless applications in health care
- Web services as a solution to interoperability issues
- Patient data management
- ROI metrics

Appendix I – Results of Group Brainstorm, Health care Pain Points

Participants were asked to note the most challenging pain points for health care organizations in the short-term (defined as six to 12 months) from three perspectives – that of the HCO (Health Care Organization), that of the ISV (Independent Software Vendor), and that of the SI (Systems Integrator). Following are the complete results by constituent group.

Health Care Organizations (HCOs)

- Access & portability of patient information
- Metrics to measure ROI in this space
- Marketplace fragmentation – multiplicity of vendors & solutions
- Drug knowledge management & dissemination – important to drug sales representative, pharmacies, physicians
- Patient-specific, personal Web pages
- Quality of data generation & data capture, e.g., charge capture – coding, billing etc.
- Access to data and information
- Vertical & horizontal integration
- Ability to base decisions on information
- Patient accessibility and modification of personal data
- "Life cycle" management
- An integrated billing system
- Wireless & PDAs for staff and physicians to input and access data
- Physicians access to accurate and timely information while maintaining confidentiality of data
- HIPAA compliance
- Security
- Lack of understanding of options available in the market
- Technology adoption rate
- End-users (patients) venue or the leverage to participate in the process and provide their requirements
- Ease of data collection and impact on patients, caregivers, and outcomes
- Reaching out to physicians; reaching out to health care staff; reaching out to research & labs; reaching out to the consumer/patient (where consumers are defined as individuals looking for medical services that have not yet selected a provider)
- Stakeholder-related demands
- Web services
- Physical space for workstations
- Human capital related issues, e.g. workflow
- Determining what data should be released
- Data ownership
- Internal access across the enterprise
- Data and information accessibility by doctors & pharmacists
- Access to technical knowledge and know-how
- Anytime/anywhere access to data by care-givers
- Educating the end-user
- Solution to the value proposition
- Back-office processes among SMEs

  1. Formularies change so frequently, billing has a hard time keeping it straight
  2. Insurance companies each request that providers submit that company's own forms
  3. Different formularies across insurance companies
  4. Changes in coding
- Continuing education for physicians

System Integrators

- Data & information exchange
- Lack of a complete all-in-one system
- Integration among disparate systems
- Data source connectivity and decision support
- "Life cycle" management
- Customer integration
- P2P technology (peer-to-peer)
- Consistent technology adoption
- HIPAA compliance

- Ease of adding and/or deleting data elements as regulation or organizational needs dictate
- The difficulty of getting a broad, system-wide view of IT requirements – both software vendors and users tend to focus on their own specialized areas
- Adequate data quality
- Lack of data standards; e.g., what information is gathered and how that information is exchanged between providers
- Paper records and willingness to digitize and place such records online

Independent Software Vendors

- Integration
- Need for a "holistic" approach
- "Life cycle" management
- Participation from future stakeholders in applications & technologies that are currently under development
- Data integrity – accurate and reliable information
- Data security
- Bandwidth
- Transaction portals, e.g., procurement for physicians, prescriptions, billing and appointments
- Web services
- Solutions that span the entire enterprise
- Security solutions
- Technologies that have not yet sufficiently developed
- Difficult access to health care organizations
- Level of technology adoption, e.g., Internet, networks, web services and technical skills
- Fundamental computing infrastructure and knowledge of use and configuration is very poor
- Standards are slow to develop
- HIPAA compliance
- Data interaction
- Lack of interoperability between software packages developed by different companies
- Inconsistent interfaces
- Defining system requirements on time
- Lack of a clearly articulated eBusiness plan or strategy among providers
- Connectivity models, e.g., ASP and point-to-point
- eHealth versus eBusiness
- Integration of virtual data and information and accessibility to such data and information
- Real-time data
- Heterogeneity and dispersion of data
- End-user requirements from systems
- Complexity of required systems in health care industry

- can one system be built to do it all?

These proceedings were written by Erik Steiner