Availability and Use of Health Information Technology in Nursing Homes:

Market Scan Report

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Key Findings

The following five points summarize the key findings from the research conducted for this market scan.

1. **Significant Gap Between Promise and Reality:** A large gap exists between the dream of the *paperless nursing home* and the reality of technology adoption today within nursing homes.

2. **Large Adoption Barriers:** There are significant barriers for nursing homes to further adopt healthcare IT (HIT) systems

3. **Lack of Compelling Purchase Driver:** There is no compelling business, clinical, or regulatory case for nursing homes to adopt clinical care technology at the present time.

4. **Immature Market:** HIT displays many distinguishing characteristics of an immature technology market

5. **Lack of Market Drivers:** There is no obvious vendor, technology, consumer behavior or regulatory change on the immediate horizon that can pull this market across the chasm into the mainstream.

Research Goals

The primary objective of this report is to characterize the Health Information Technology (HIT) market among US nursing homes circa 2008. To accomplish this, we evaluate the market along the following dimensions:

- **Vendor Landscape:** We describe the overall landscape of HIT vendors in the nursing home sector that provide software for administrative and care-related processes. The goal is to complement the details available in published reports (i.e., *McKnight's Long-Term Care News* and *Provider Magazine*) by comparing a select group of offerings along important dimensions.
- **Market Dynamics and Vendor Motivations:** We identify key dynamics that characterize vendor behavior in both the sales and research & development (R & D) arenas.
- **Adoption Barriers:** We describe the HIT adoption process from a vendor's perspective, including the 10 most common barriers as reported by interviewed vendors.

Research Methods

The Market Scan is a qualitative effort that focuses on the vendor's perspective regarding the adoption of HIT in nursing homes. We employ three approaches to collect data for this report:

- **Informational research:** We reviewed content from vendor and industry Websites, including product collateral and customer case studies.
- **Secondary research:** We reviewed reports in *McKnight's Long-Term Care News* and *Provider Magazine,* as well as select industry-specific research reports.
- **Interviews:** We conducted a total of 17 vendor, consultant and expert interviews across 12 organizations to assess the state-of-the-market, and to understand adoption barriers and

user motivations from a vendor's perspective. The list of organizations is included below in alphabetical order. (Please note that the findings should not be attributed to any specific interviewee.)

Type	Companies
Software Vendors (12 interviews across 8 companies) Job Titles: Executive, Product Management, Marketing, Sales, and Services	Accu-Med Services American HealthTech Answers on Demand eHealth data Solutions HealthMEDX, Inc. KeaneCare MDI Achieve Vocollect Healthcare Systems
Nursing Home Consultants (3 interviews across 2 organizations)	Aging Research Institute HealthWare Consulting Services
Experts (2 interviews)	Golden Living, LLC McKnight's Long-Term Care News

Results

The results are organized into four sections. The first provides a description of the vendor landscape, followed by an assessment of the dynamics of the marketplace and vendors' motivations. The last two sections describe the current state of adoption and barriers to progress as reported by vendors.

I. Vendor Landscape

A. The IT landscape is crowded, with dozens of vendors, and a lack of clear market share leadership. McKnights Long-Term Care News included 36 vendors in its *2007 Software Source* report, while Provider Magazine included 52 vendors in its *2007 Long Term Care Software Supplier Guide*. No single vendor appears to have a market share above 10%, nor has any trusted third-party performed a market share study to validate vendor claims about their customer base.

B. Vendors are not meaningfully differentiated on capabilities or focus. The vast majority of vendors offer software with broad functionality in financial / administrative management and clinical applications, suitable for several types of clinical environments – CCRCs, SNFs, etc. While differentiation and specialization certainly exists, the advantages and limitations of various software packages are not readily apparent in vendor marketing materials.

C. Firms that appear to be the leading vendors based on customer numbers are difficult to distinguish based on available features in their respective products.

Overall, our review finds ample evidence that the HIT market in nursing homes – especially in supporting clinical care processes – is best characterized as an early or immature technology market [see *Market Dynamics* below].

II. Market Dynamics and Vendor Motivations

A. *Clinical care software for nursing homes shows many signs of an immature technology market.*

Features of the LTC IT space are consistent with an immature or early adopter market. Best defined by Geoffrey Moore in his landmark book *Crossing the Chasm: Marketing and Selling High-Tech Products to Mainstream Customers*[1], technologies are initially pulled into the market by enthusiasts and visionaries, but later fail to get wider adoption without strategies that are designed to 'cross the chasm.' In other words, there is a big difference between initial adopters and later adherents, firms that are described as 'pragmatists', 'conservative'. A small portion are considered skeptics that are highly unlikely to innovate.

Early adopters of an innovation like HIT can be characterized as 'prospectors', following the framework laid out by Miles and Snow.[2] These firms are comparable to the enthusiasts and visionaries identified by Moore and Geoffrey. Prospectors are the first to adopt a new technology, followed by analyzers. Later firms are termed 'defenders', and 'reactors' are those that move last. Notably, adoption may be incomplete, with some reactors refusing to incorporate even a proven innovation. As shown on Figure 1, this schema lends itself to a quantitative interpretation. As time progresses, the proportion of firms that adopt a particular technology increases. Firms can be characterized by the timing of their decision to innovate.

[1] Moore, Geoffrey, *Crossing the Chasm*, HarperCollins, 1991
[2] Miles and Snow

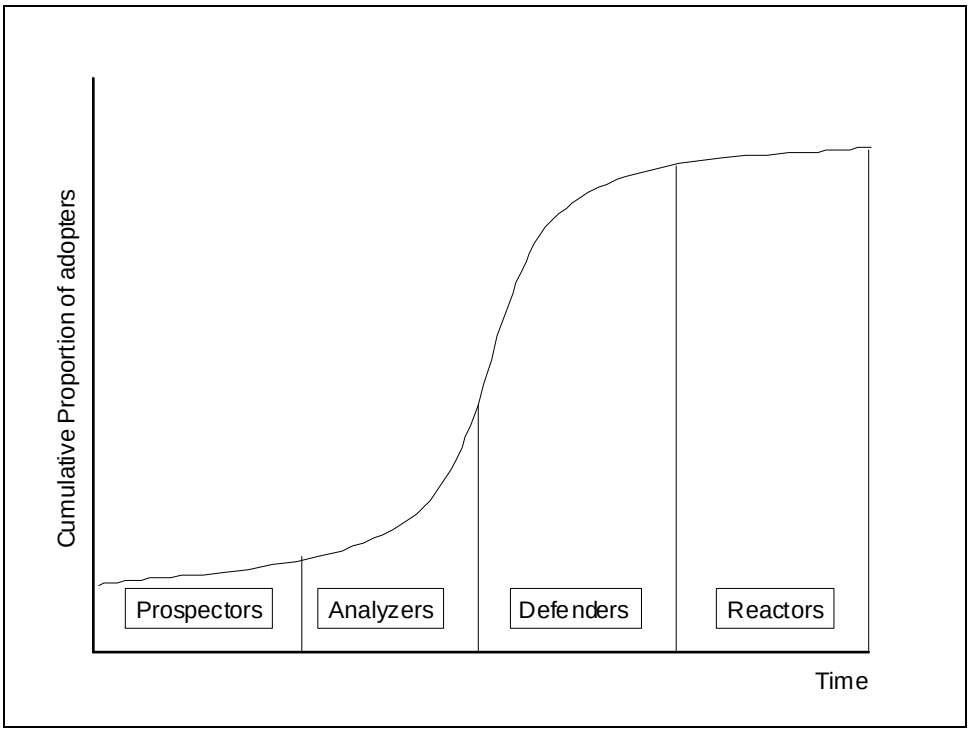

Figure 1. Temporal Model of Technology Adoption

For radical innovations, adoption is very rapid, and all but the skeptics will adopt very quickly. This typically occurs with innovations that have very obvious and significant advantages compared to the status quo. The left side of Figure 2 shows the temporal pattern for rapid adoption of a new technology. By contrast, the right side of Figure 2 shows the temporal pattern for delayed adoption.

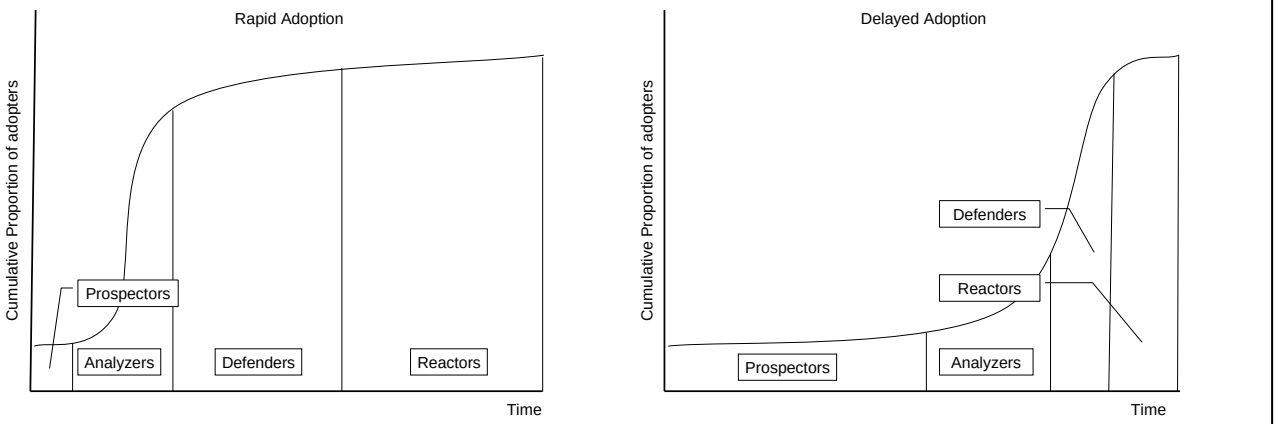

Figure 2. Rapid and Delayed Adoption Curves

Markets with delayed adoption are typically fragmented, with no vendor holding a dominant market share. According to Moore, early, immature technology markets have distinguishing characteristics. We identify and apply these to the nursing home HIT markets:

Characteristic	Evidence in Nursing Home Clinical Care
Fragmented market, many vendors, lack of dominant market share leader	Over 20 vendors with no vendor appearing to have more than 5% market share
Too many vendors & options for consumers to digest	RFP and proof-of-concept processes do not produce meaningful differentiation for consumers.
Lack of vendor differentiation or specialization	Each vendor appears to do everything – from financial/administrative to clinical management to point-of-care systems.
No meaningful efforts towards standardization to drive broader adoption	There are few vendor- or industry-led efforts towards information exchange or standards adoption.
Lack of *killer applications* that drive broad purchase	The *killer applications* that do exist center on MDS submissions and reimbursements – both of which are administrative, not clinical applications. No dominant software features exist today for actual clinical care processes.
Long and complex sales cycles	Sales cycles are estimated by vendors to be between 12-24 months.
Difficult-to-deliver feature sets	Modeling and automating clinical care processes in software is exceedingly difficult to do.
Regulation limits market development	Addressing both federal and state-by-state regulatory requirements [e.g., Medicare MDS and state Medicaid reporting, HIPAA privacy] in clinical care products presents a large challenge. This sometimes onerous effort forces vendors to focus on individual state markets, limiting standardization and discouraging vendors from scaling across regions.
Limited effort towards market consolidation	Only MDI Achieve has made any significant progress in consolidating the market, but has captured less than 10% of the market by some estimates.

There is no obvious vendor, technology, consumer behavior or regulatory change on the immediate horizon that can pull this market across the chasm into the mainstream.

B. *There are meaningful signs of maturity in the vendor landscape.*
Despite the current lack of motivation to invest in LTC HIT, there are a number of trends that will likely have a positive impact on adoption which are happening over the next 12-24 months. These include:

- **Decreasing Acquisition Cost:** Almost all vendors have moved from expensive up-front investment model for complete software packages to a modular pricing model that enables nursing homes to purchase only the features they want to deploy. This makes at least part of the financial barrier significantly lower, and enables nursing homes to invest in more clinical care modules only after initial success.
- **Vendor Technology Investment:** Vendors have already made technology investments to mature their products from client-server to Web-based architecture. This lowers customer cost of ownership dramatically. In addition, vendor R&D investment in clinical care seems genuine – many vendors are betting on the market developing.
- **Vendor Consolidation:** Some vendor consolidation is happening [e.g., MDI Achieve] and at least one large HIT vendor has entered the nursing home IT market [Keane in 2000. Note that Keane has annual revenues in excess of $1 billion]. This will likely continue as broader institutional support for health-related IT investment increases.
- **Vendor Differentiation:** There is one major trend towards differentiation and specialization around point-of-care systems from vendors such as Accunurse and CareTracker. Other vendors interviewed such as KeaneCare and Answers on Demand are partnering or licensing these point-of-car1e technologies to deliver the end-devices for frontline healthcare delivery.

C. *Vendors are shifting from best-of-breed to single platforms.*
Another characteristic of a maturing market is when vendors move from being a best-of-breed provider of one function (e.g., billing) to instead providing an integrated platform that encompasses all functions (e.g., billing, patient care, EMR, etc.)

This is a double-edged sword. While in its infancy today, with vendors claiming to do everything (a point covered above), over time, this will be a positive for the market. The last generation of technology investment in best-of-breed systems led to integration challenges between clinical, financial, operational and other systems. Larger and more sophisticated customers do not want to make the mistake twice, and are hesitant to have multiple stores of patient/resident records or even vendor relationships.

While today there are many marketing claims about how broad vendors are as platforms, over time, the vendors that win will provide real customer benefit from their platforms by offering complete feature sets, proven interoperability with other systems, and tangible benefits such as lower cost of implementation and use.

Given these characteristics, we believe the HIT market – especially in its support of clinical care processes – will remain an immature market for the foreseeable future.

Software vendors claim nursing homes see these investments as expensive, difficult, voluntary, and with questionable payoff. Plus, according to vendors, many facilities have had negative experiences in implementation as well. This is a recipe for slow market growth.

D. *Vendors are acting in their own short-term self interest, which is often in opposition to growing the overall market*

This is yet another early-market symptom, and manifests itself in a number of ways:

- **Customer Lock-in:** Vendors are strategically concerned with customer lock-in, and are striving to be the single *EHR System of Record*, whether or not they provide a critical mass of features.
- **Over-customization:** Vendors' desire to satisfy customer needs through customization hampers vendor scale – professional services revenue is attractive in the short term, but limits how many customers each vendor can service. Most vendors offer professional services, and the majority of transactions include some implementation and training services. However, a majority of vendors interviewed expressed a concern over inability to deliver enough services to drive proper adoption and use. For vendors who desire the high profit margins of software, it is too costly to deliver this level of personal service to each customer.

E. *Vendors are awaiting external forces to drive adoption*
Vendors believe that regulation or incentives are required to get customers to buy in mass. A need for federal HIT initiatives, the concept of an EHR mandate, CCHIT certification, the upcoming MDS 3.0 shift, and CMS incentives were mentioned by practically every vendor.

F. *Completely paperless systems – beginning with electronic charting – offer promise but are in their infancy from an adoption perspective.*
Vendors believe in the promise of the paperless nursing home, but realize this is years from being realized. First, there is a dearth of vendors who innovate in the area of electronic charting. Second, a paperless system would require even greater interoperability among disparate systems. Given the challenges of interoperability between just two systems in a nursing home setting, or between a nursing home and CMS or a Fiscal Intermediary, this is a daunting technology hurdle.

Summary

It should be noted that respondents did not mention several factors that might generally be expected to drive providers to innovate. For example, professional norms and expectations about innovation and using technology, common in other parts of the health care system, are weak in the LTC sector. Likewise, the major payors for nursing home care, Medicare and Medicaid, have not placed mandates on providers to use HIT beyond what is required for basic regulatory and payment purposes. Finally, there was no discussion of pressure from residents or their families to demand progress in HIT implementation.

III. State of Adoption: Vendor's View

A. *Most facilities have purchased something for clinical care, although few have implemented.*
While the purchase and use of HIT software in nursing homes may be high, vendors freely admit that this represents purchase not implementation of clinical care software, and that most users rely only on the administrative functions. Furthermore, it's unclear how many facilities have purchased a software package only to move on to using another vendor's offerings.

When mandated – MDS submissions, and state-specific electronic reporting requirements (e.g., for case-mix adjusted Medicaid payments) – technology adoption may be universal, but these applications are peripheral to actual day-to-day use of IT for clinical care processes.

Vendors openly recognize the gap between availability and routine use. They claim that few facilities are using software for clinical care processes in any meaningful way, and more than one interviewee claimed that in reality there are no facilities that are *truly paperless* throughout the full range of care processes.

B. *Customer motivation to buy is low due to misaligned costs and benefits*
Simply stated, there is no compelling business, clinical, or regulatory case to adopt nursing home clinical care technology at the present time. This may be the single largest limiting factor limiting adoption (see *Adoption Barriers* below). Looking at this from the three perspectives shows an imbalance between the benefits and costs from the customer's standpoint:

- **Business Motivations:** The financial benefit derived from adoption of HIT products– real or perceived – is not compelling enough to act. These benefits may come from faster reimbursements, better staff utilization, fewer violations and fines, and overall process efficiency. On face value, none of these may be sufficiently compelling, and more importantly, most of these are difficult to quantify. An important counterpoint is that the financial benefits of more efficient billing (especially under Medicare PPS) are readily quantifiable, and this may explain in part why administrative rather than clinical demands drive acquisition. This can lead to pressure for more accurate documentation of resident health status, but only insofar as it improves revenue. Furthermore, the decision to enter or remain in a nursing facility does not appear to be driven by the availability and use of HIT software.
- **Regulatory Motivations:** There are mixed signals whether there is or will be an EMR (electronic medical record) requirement. Are regulators and policy makers convinced that implementation of an EMR is a high priority? The EMR mandate doesn't exist today, and based on vendor reports, nursing homes are uncertain whether such a requirement is imminent.
- **Care Motivations:** Many vendors claim Quality of Care improvements from their software, but the shortage of evidence supporting this contention, make these claims difficult to justify. Higher quality of care is not necessarily linked to higher financial returns; hence provider motivation to improve the quality of care is often framed by vendors from the standpoint of avoidance of fines, adherence to mission, or ethical concerns. Furthermore, the health care providers are not licensed and/or certified based on their ability to operate HIT software, and may receive limited training on how to use various packages.

On the cost side of the equation, the price of adoption is very high – going well beyond the software cost itself, encompassing additional technology, implementation, process re-engineering, training, to name a few. Vendors generate further skepticism by hyping non-

existent or difficult-to-implement features and relying on questionable return-on-investment (ROI) estimates.

C. *Nursing Homes typically take 12-24 months to choose clinical care HIT systems*
On the acquisition side, nursing homes typically engage in a long and thorough evaluation of clinical care software before purchase. Efforts are centralized, typically by management (and IT leadership in larger facilities), with buying teams who issue RFPs, collect vendor information, and manage multiple rounds of RFPs and responses, extensive vendor meetings and demonstrations.

D. *Clinical features and overall applicability of HIT software to support clinical care processes is often an afterthought in system choice*
Financial and clinical care systems are typically bought at the same time, usually from the same vendor, and more often than not, driven by the CFO or key administrative leadership. According to the vendors interviewed, clinical leadership has a seat at the table, but is rarely the ultimate decision maker. As long as the software contains key clinical care items, and is deemed satisfactory by the clinical staff, they are considered good enough to meet clinical needs.

This purchasing process creates an environment where vendors are marketing and selling primarily to the administrative (and not the clinical) staff in nursing homes. Administrative-oriented clinical features like accounting, census, bed management, and regulatory reports, which have a value for nursing home administrators, are highlighted more than features that may actually benefit quality of care such as clinical decision support and automatic screening for medication errors. Marketing strategies have more to do with improving administrative efficiency than reducing paperwork requirements for clinical staff. [3]

E. *Selecting and purchasing clinical care software for nursing homes is just the beginning of a long process*
Unlike financial and administrative software – which is implemented quickly – clinical care software by comparison is often slow to deploy, taking up to 12-18 months after purchase for full rollout. In fact, many interviewees discussed the prevalence of *shelfware*: software that has been purchased but never implemented.

There are several factors that inhibit implementation and use of HIT in nursing homes, even after a sizeable financial investment. Facilities face technical hurdles including upgrades to hardware and network infrastructure (although the growth of Web-based software helps). Process-wide, facilities must either adjust their clinical care processes or customize their software to match their existing work-flow and patient care processes – either approach takes time and investment. Finally, training is an issue, with care providers who may not be computer-proficient, and organizations that may have high staff turnover at all levels of the facility.

[3] Chaudhry B, Wang J, Wu S et al. Systematic review: impact of health information technology on quality, efficiency, and costs of medical care. Ann Intern Med 2006;144:742-52.

Many facilities do not realize the implementation hurdles at the time of purchase, and vendors are mixed in their motivations to tell their potential new customers about these hurdles. Implementation and training services are desirable revenue sources for some vendors, while others simply want a rapid software sale. This leads to an interesting selling dynamic – vendors do not effectively tell users about the investment of implementation, leaving facilities typically unaware of the pain that is going to cause.

IV. Adoption Barriers: Vendor's View

Table 1 is a list of key adoption barriers identified by vendors and consultants. It is important to note that this list is based on the surveyed vendors' viewpoints. Nevertheless, the vendor perspective is informative, and more importantly, this list contains several barriers identified by almost every interviewee and reflects issues that need to be addressed in order to accelerate the adoption of HIT in the nursing home setting.

Table 1
Barriers to HIT Adoption in Nursing Homes

Barrier	Description
1. There is no mandate to buy or implement HIT systems for clinical care processes	Many view this as an industry that needs to be told what to do. Without a regulation from state or federal authorities, many question whether facilities will make the jump to EHR and other clinical care software, even if the benefits far outweigh the cost. Many believe that the upcoming EHR mandate, if it is truly enforced, will be the motivation required to make this happen, although interviewees differed on when and whether it would happen, and how facilities could afford to meet the mandate. Note that this was the leading barrier to adoption for a majority of the interviewees.
2. HIT systems are a risky investment with a questionable financial, regulatory or clinical return	Vendors have a hard time articulating the ROI for clinical care software investments. First, the cost of these systems is prohibitively expensive. Software, hardware, networking, IT management, implementation and training costs are all significant in moving to clinical care software. Ironically, the growth of Web-based software at a lower cost of entry may actually hurt since facilities cannot purchase these with more readily available capital budget. Second, it can be difficult to identify the direct financial benefit delivered by the software. Unlike financial or operational software which helps companies manage employees, finances or facilities, and have hard-dollar benefits, the economic benefit of clinical care software is hard to determine. Plus, other benefits – improving quality of care or patient experience – are soft

	benefits and are difficult to quantify. Finally, it is important to realize that the software itself represents a minority of the overall cost of implementation, yet vendors often quote a dramatically *High ROI* for their software, which is misleading for customers.
3. Choosing a HIT system is a laborious process	The process of selecting a clinical care software vendor is a significant barrier in itself. Facilities – often without an IT department – must wade through dozens of vendors seemingly offering the exact same capabilities to choose the right one for their facility. Significant budget and staff time must be secured up front, which is challenging, especially among clinical care staff. Few facilities – except for large chains – are sophisticated enough to make these decisions, and must rely on consultants or the vendors themselves to understand requirements. Without meaningful vendor differentiation or trusted third parties rating vendors, it is hard to know which vendors are being truthful in their marketing claims. Decisions must be cross-functional – meeting both administrative and clinical needs. Often, clinical leadership is not *bought into* the idea of using technology for clinical care at all, and acts as a retardant in the purchase process.
4. The complexity of implementation limits adoption after purchase	Once clinical care software is selected, the implementation process is very time and labor intensive. Many vendor interviewees claimed that *EHR is a 1-2 year process at a minimum.* In order to fully deploy a system, a facility must install and manage the appropriate computer hardware and network infrastructure (made easier by Web-based software and WiFi wireless networking, but still complex); model and replicate clinical care processes within software – often re-engineering processes or customizing software; train staff to shift to electronic records or transcriptions of paper charting, and dedicate to manage the overall system and produce/analyze its reports. This is a big departure from the typical way nursing homes handle clinical care processes. Any change of this magnitude, with this number of moving parts – both technical and behavioral – is difficult to realize.
5. Lack of best practices for purchase, implementation and use	Closely tied to #3 and #4 above is the fact that there are no best practices for purchasing or using clinical care systems in nursing homes. For nursing homes that do not have expertise in either

	clinical care software or process change, this is another challenging adoption barrier. Nursing homes cannot find a standard or proper way to model their clinical care processes with software. Organizations rely on consultants or interpret the few frameworks or guidelines that exist (such as HL7 SNOMED). Simply stated, oftentimes nursing homes don't know where to start, or understand the up-stream and down-stream impact of changes they make. For instance: How will electronic charting affect Medicaid reimbursements? Once these questions are asked – and not answered – purchase or implementation often stalls.
6. Facilities still harbor a significant reluctance to document processes and results	There is a clinical reluctance to document clinical care processes and results, driven mostly by regulation and litigation concerns. Historically, documentation has been solely driven by regulation, which means the only reason to document is to complete required state and federal surveys. In the mind of some nursing home administrators and clinical care directors, the best-case scenario for documentation has been to avoid fines. In other words, the sole benefit of documentation is avoidance. Clinical staff does not view documenting processes as an opportunity to improve care or processes, just as a *necessary evil* to meet licensure requirements and receive Medicare reimbursements. A number of vendors mentioned that this was a powerful barrier especially in high-liability states such as Florida and Arizona, with *billboards from lawyers encouraging residents and family members to sue their nursing home for neglect.* In this environment, the reluctance to move to EHR is understandable.
7. The underlying realities of nursing homes often act against adoption.	Many vendors pointed out that nursing homes themselves are not technology buyers, and will never be motivated to be so, because of who they are. Nursing homes are run as a very low margin business, and IT investment is lower than most of other areas of healthcare, and much lower than other industries. From an ownership perspective, many nursing homes are operated as real-estate investments – owned by REITs who are not seeking either efficiency or clinical care improvements.

	Those that are profit-seeking look at the real estate side, not at the clinical side. Culturally, caregivers are not a demographic that is likely to embrace technology. There are many older and non-English-speaking caregivers, and the high turnover rate among front-line caregivers makes training even more expensive.
8. Many clinical care processes require inter-company information exchange	Unlike acute and ambulatory care, where many of the processes are under the same hospital roof and ownership, nursing homes must interact with various organizations in clinical care processes. A nursing home must share its patient records within their facility, and outside medical groups, hospitals, pharmacy providers, payors and regulators – throughout the clinical care cycle. This makes the portability of resident records and clinical care processes critical. Since few standards for interoperability exist, and nursing homes are not pushing themselves to automate the information flow between them and other players, this is yet another significant barrier.
9. Significant product gaps exist in supporting clinical care processes	Going beyond vendor marketing materials, the truth is that there is a big functional gap of what vendors actually deliver. This was the honest perspective of many of the vendors themselves, along with consultants who help facilities with purchase and implementation. Software vendors very often have products that do not in actuality meet the clinical care documentation needs in reality – investments are closing the gap, but it has not happened yet. Some clinical packages are better described as *built to sell*, with many dashboards that satisfy management's view of clinical care, but do not deliver the clinician value. The software just does not yet model procedurally complex clinical care processes. One interviewee recalled an experience with an RFP process that showed ZERO *of 13 top vendors had products that could go in and meet real-life care management aspects that are done on paper.*
10. Implementing the complete package of functionality is hard for facilities	Closely related to #9 above – customers struggle to implement complete functionality in the packages they purchase, failing to take advantage of the even limited clinical care features they have just acquired. Full package implementation is rare.