



ElderAlert: Building a Business Model for a Home Healthcare Automation Venture

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1. Introduction¹

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Jeff sat in his home office faced with the task of deciding on a business model and then, developing a proforma P&L as a key part of his business plan to raise startup funds. All this was for a new venture focused on medical monitoring for the elderly.

Jeff was well experienced in assisted living operations and management. In his prior job, Jeff had been the operations manager for a regional branch of a large assisted living company, running all resident services and physical operations for twenty different facilities. He had worked in this capacity for five years. And before that, Jeff had started and grown a successful computer systems integration company serving mid-sized corporations. That company had been acquired after seven years of growth. Now in his early 40s, Jeff was primed to start his next company.

Now, Jeff wanted to combine his experience in health care delivery with computer system integration. The target was medical monitoring. However, rather than bring medical monitoring to the mass residential market, he thought it best to find a more specialized niche. He set his eyes on the rapidly growing market segment of assisted living centers.

Jeff had talked to a number of venture capitalists who seemed skeptical only because other companies had tried to provide automated alerting before, and failed. Yet, one seemed keenly interested in Jeff's ideas and his team. "Get me a business plan, and most of all, show me how this is more than good technology. Show me how it makes money," the VC said. Doing precisely that was Jeff's intention. An anticipated \$5 million in Series A financing hung in the balance.

1. This case is based on a company that received funding in excess of \$5 million to pursue this opportunity. All names have been disguised, including those of the assisted living center companies. The numbers used in various parts of the case are highly representative of those used by the entrepreneur to build the business plan.

2. The Market Opportunity Serving the Elderly

The growth in the elderly at risk medical population is extraordinary. This growth is being fueled by the annual retirement of Baby Boomers, beginning in earnest in 2015 and accelerating over the next ten years. According to the U.S. Census Bureau, the number of individuals in the US between the ages of 65 and 84 would increase by 38.8 percent between 2010 and 2020. And the population over age 85 would increase by 18.7%. As for new technology for health care monitoring, Forrester Research predicted that the personal health monitoring market sales in the US would reach \$34 billion by 2015.

According to the Administration on Aging (part of the United States Department of Health & Human Services), persons 65 years or older numbered 39.6 million in 2009 (the latest year for which data is available). They represented 12.9% of the US population, about one in every eight Americans. By 2030, there would be about 72.1 million older persons, more than twice their number in 2000. People 65+ represented 12.4% of the US population in the year 2000 but were expected to grow to be 19% of the population by 2030. In terms of potential users, Jeff was clear facing a growing market.

This demographic trend was also being felt in Western Europe, Japan, and increasingly, in China. In fact, the aging of the global population was happening faster than ever before. For comparison purposes, it took France almost 120 years to see its citizens age 65 years or more double from 7% to 14% of the entire French population (achieved in 1980); and the United States about 67 years see the same sort of percentage doubling from 7% to 14% (achieved in 2010). But in BRIC countries, this aging was occurring exponentially faster. Indeed, for China, citizens 65 years or older were about 7% of the population in 2000 and were expected to hit 14% of the entire population in just 12 years! Brazil was predicted to see the same sort of doubling of the 65 years plus population in just 10 years.²

The majority of this growing elderly population required some degree of formal and/or informal care either due to loss of function or failing health as a result of aging. According to the US Center for Disease Control, by 2010, nearly three quarters of elders over the age of 65 suffered from one or more chronic diseases. The cost and burden of caring for elders was steadily increasing. As a source of medical expense, the chronically ill in the U.S. represented over 80% of hospital inpatient stays and 90% of prescription drug usage (from studies done in 2004 and 2005 in the *New England Journal of Medicine*).

By 2010, there were roughly 23 million people caring for about 45 million elders (65 and over) in the US, which was expected to increase to 78 million by 2020. Industry observers generally noted four major markets for elderly care: home health care, assisted living centers, nursing homes, and hospices.

2. Kinsella K, He W. *An Aging World: 2008*. Washington, DC: National Institute on Aging and U.S. Census Bureau, 2009.

Home health was by far the largest of the four segments, with over 12 million individuals in the US required some form of home health care and over 30,000 agencies providing that care. Approximately 70 per cent of these recipients were over the age of 65, with most common medical conditions requiring ongoing treatment being diabetes, heart disease, chronic ulcers of the skin, osteoarthritis, and hypertension. In 2010, more than \$70 billion was spent on home health care alone, with the US government insurance program, Medicare, being the single largest payer of home care services.³ This segment was also showing signs of becoming more concentrated in terms of providers. A number of large home health care agencies in the US already had hundreds of thousands of individual patients under management. The standard mode of health care operation was to have “visiting nurses” go to patients’ homes to directly administer care and record information on portable computers. New technology was also being deployed to increase efficiency in home health care, including mobile diagnostic tools (such as blood diagnostic kits), telemedicine or remote consults, and Internet-accessible electronic medical records. While Jeff was sure that the home health care segment would soon grow to be a \$100 billion industry by itself, the sheer number of residents and the complexity of installation sensors and communications technology – each house was designed differently – made home healthcare challenging as an initial target market for healthcare automation.

Assisted living centers (or communities) – the second market segment – looked more promising, both in terms of technical feasibility and actual selling. This segment was already approaching \$50 billion in annual service revenue, with over 30,000 facilities and growing rapidly. Assisted living facilities provide services for seniors who wish to remain independent but still need some assistance with daily living. An assisted living community is a set of individual apartments or townhouses, leased by residents, that are serviced by a common maintenance, health care, and lifestyle services staff. The typical fee in 2010 was between \$3,000 and \$4,500 per month. Approximately one million residents called an assisted living center home in the US in 2010, aged approximately 85 years old, 74% of which were female. The number of residents was expected to double over the next several decades driven by the retirement of over 75 million Baby Boomers. The majority required assistance bathing, and many needed help dressing and toileting. Nearly all needed assistance with medication management and meal preparation. The standard mode of operation for high quality assisted living communities was that residents received a full medical review upon entrance. This was used to help deliver and monitor medications, provide ongoing medical care, and better handle emergencies. The average length of stay was approximately 3 years.⁴

In the US, there were approximately a half dozen large, billion dollar plus corporations that already had thousands of units under management with

3. The National Association of Home Care and Hospice, Washington, D.C. Basic Fact Sheet, 2010. www.nahc.org.

expectations of doubling their capacity over the coming decade. For Jeff and his venture, these large assisted living center companies represented an important channel to market.

From Jeff's perspective, the fact that many of these assisted living facilities were newly constructed following standardized architectural designs made them a much easier target for installing new technology compared to individually constructed homes in the home healthcare segment. Plus, modern assisted living centers featured a centralized communications infrastructure with on-site response centers staffed with trained nurses and medical technicians. This meant a medical monitoring alert would ordinarily lead to a rapid, qualified, on-site nursing response. For Jeff's technology "to work", the human factor was clearly as important as the technology itself.

The third market segment – nursing homes in the US – was highly fragmented, a true "mom and pop" industry with thousands of nursing home companies. In 2010, there were over 1.7 million beds in registered nursing homes in the US. It was already an approximate \$100 billion dollar industry based on both government reimbursement and private, family payments for nursing home care. The quality of care in US nursing homes was suspect, however. It was a problem-ridden industry with high levels of patient complaints and low pay for attendants. One 2006 study reported by the American Association for Justice found that over 90% of nursing homes had staffing levels too low to deliver the needed quality care to residents.⁵

The fourth market segment, hospices, was nascent but growing. These services were focused on end of life care, otherwise known as "palliative care." By 2010, there were over 4,000 hospice facilities in the US, a number which was expected to grow as physicians were becoming increasingly mindful of the quality of life and expense ramifications of having the terminally ill end their days in intensive care units within the hospital.⁶ However, it was not clear that how important value-added medical monitoring and alerts services would be for those persons at an end-of-life stage.

Across all segments, experts noted that health care providers focused on the elderly were already at shortage in 2010, and that this problem would grow more severe owing to the dramatic demographic trends underway in the US. As a result, the elder care industry was growing rapidly, providing both new facilities and in-home care services. At the same time however, there was a clear shortage of trained care providers – primarily nurses. Together with rising costs of

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4. Robert Mollica, Assisted Living and Residential Care in the States in 2010, AARP Public Policy Institute, Washington, D.C., available from the The National Center of Assisted Living, (<http://www.ahcancal.org/ncal>), a good source for additional information on assisted living.
 5. The American Association for Justice, Nursing Home Statistics, 2006. Washington, D.C. See: <http://www.justice.org/cps/rde/justice/hs.xsl/3005.htm>.
 6. The National Association of Home Care and Hospice, Washington, D.C. Basic Fact Sheet, 2010. www.nahc.org.

providing such care, the industry needed some type of automation to drive efficiency. For someone like Jeff, this spelled great opportunity.

3. The Specific Business Opportunity

Jeff had run into a brilliant university-based scientist who had developed noninvasive, passive monitoring devices that could be used to measure heart rate, breathing, and movement in an individual's bed. These sensors could be tuned to individual's medical conditions by downloading instruction sets from a central server. The scientist thought that the same sensors could be easily incorporated into chairs and even toilet seats!

Jeff had substantial experience in computer systems integration and software development. With appropriate funding, he knew he could secure the services of a nearby 3rd party software development firm to build the centralized server software need to link the inputs from these sensors and compare the data to patient information, using comparative analytics to initiate alerts and workflow management software to track response. This server software would be a rules-based, workflow engine to notify care providers and potentially families of an impending disaster. Having managed assisted living centers himself, Jeff knew exactly what was needed – not only for the residents, but for their families, nursing staff, and assisted living center managers. This system would be proprietary, wireless, smart.

The scientist, who would become the CTO of the venture if funded, had also developed proprietary fall detectors that could differentiate between a human body falling to the ground and a book or chair. These, too, would be part of the overall solution. An elderly person's great fear is to fall, break a hip, and die all alone in his or her apartment. This scientist's technology could help eliminate that fear.

Jeff segmented the market into care at home for the elderly, assisted living facilities, nursing homes, and hospice care. Considering the data shared earlier in this case, he preferred assisted living facilities because a) the segment was large and growing, b) the technical feasibility of installation and ongoing utilization was greater than say in home healthcare, and c) there were large corporations in assisted living with whom he could work as marketing and operational partners. If he provided the correct financial incentive, these companies might become selling partners.

In addition, the type of resident in an assisted living center seemed well suited for medical monitoring automation. The typical resident was someone who wanted to live independently, but get assistance for medication management and certain activities of daily living. A noninvasive alerting system that would only call nursing case when needed would seem to fit into this assisted living arrangement. Plus, this market segment offered the promise of noninsurance-

based revenue directly from residents or their loved ones (as opposed to nursing homes and certain home health care services which primarily reimbursed through Medicare, a tightly regulated and controlled US government public insurance program.)

As for the other market segments, Jeff had concerns. The sheer size and complexity of the home health care market scared him. Being “successful” would overwhelm any new, young company. Plus, installation of equipment in individually designed homes would be more difficult relative to more institutional settings. The nursing home industry was known as having poor management and unsatisfactory medical outcomes – Jeff didn’t want to get caught up in this type of environment. And the hospice segment was one where residents didn’t really require continuous medical monitoring. Their needs were different: the comfort and care provided by direct, human palliative intervention. At the same time, if he succeeded with assisted living companies, Jeff thought his venture might grow into home health care with a few large, well-known health care agencies as partners. This, however, would be a second phase of company growth.

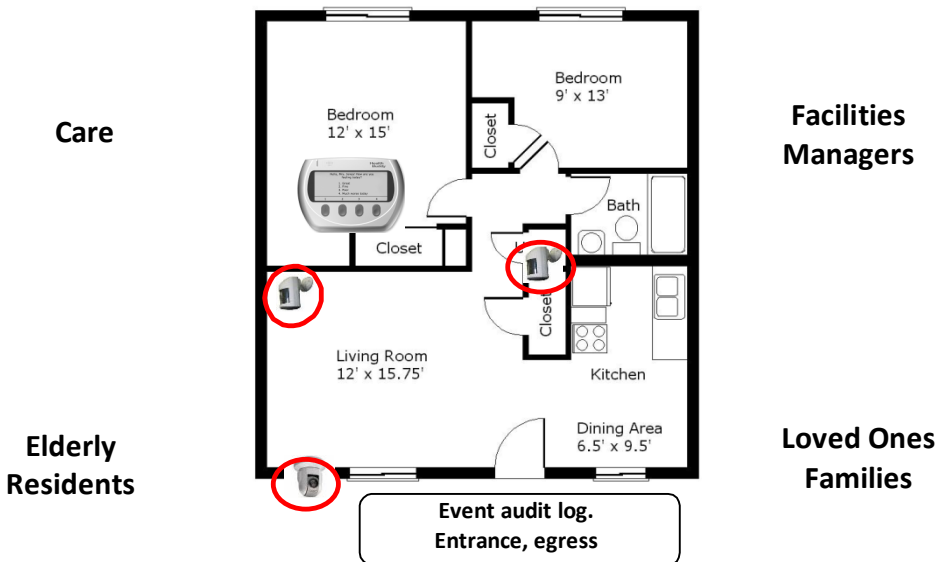
Having also worked in the assisted living industry as a regional operations manager, Jeff used his existing industry contacts to hold meetings with a number of executives in some of the large assisted living companies. These talks validated his concept that medical monitoring automation made good sense for assisted living center companies. Executives told him that his solution might lead to:

- **More revenue per resident:** An effective monitoring system would invariably lead to longer lives, and therefore, on average longer stays for residents. Plus, monitoring might show areas where a resident might require additional healthcare services – and therefore pay more money. This might include the onset of cognitive impairments that would lead to more nursing and medication management services by the assisted living provider.
- **Improved healthcare to support pricing:** The system could provide more timely alerts on either emergency conditions or emergencies in the making. This would directly improve the quality of care and support premium pricing for assisted living services. Detecting, alerting, and responding to heart and breathing issues, falls, and impeded activities of daily living were powerful drivers for improved care. One 2006 clinical study had shown that the average total cost of an ambulance-facilitated hospital readmission, workup, and discharge was already in excess of \$13,000 in the US.⁷ Preventing hospital admissions / readmissions through medical monitoring could be a significant cost saver for individuals, their insurance companies, and Medicare.

- **Operational efficiency:** Additional data could help the health care coordinator in an assisted living center assess the timeliness and effectiveness of nursing staff interventions. This included response times to medical emergencies and medical outcomes. In fact, a little RFID reader could be installed at resident's doors, which could detect and register the staffperson's appearance to the second. These data could also help the coordinator prioritize nursing staff workloads.
- **Organizational effectiveness:** Aggregated activity and outcomes data that could help facility managers to design and implement policies and programs to improve wellness. For a number of the larger assisted living companies, "wellness" was more than a marketing slogan; they were already investing significant resource to reduce injury, improve medication management, and respond to emergencies. Guiding these efforts with actual data would be greatly valued.

Figure 1 places these benefits into the actual context of the different users of medical automation:

Figure 1: The Participants in Remote Medical Monitoring



7. Alwan M, Dalal S, Mack D, Kell SW, Turner B, Leachtenauer J, Felder R. 2006. Impact of monitoring technology in assisted living: outcome pilot. *IEEE Transactions on Information Technology in Biomedicine*. Jan;10(1):192-8.

Jeff and his partner scientist designed an overall monitoring system that featured:

1. A variety of sensors, placed at points of interest throughout the residence, including beds, chairs, hallways, bathrooms, and doors. These sensors would measure pulse/heart rate, movement, and falls. The sensor technology was appropriately licensed from the scientist's university, one known for its research in medical and computer technology. The most important sensors were "bed strips" with vacuum sealed sensors contained within the bed strip. These sensors would pick up movement, heart rate, and breathing activity. Comparing these simple data to time of day and baseline patient information could be very powerful indicators of wellness, or a crisis in the making.
2. Wireless communication in the sensors linking them to a central wireless router in the apartment itself.
3. The router would send data to a central server, containing a patient database and a proprietary workflow engine that customized alerts to particular individuals based on their medical condition and individual preferences.
4. Communications and collaboration software to coordinate response amongst the patient and care providers, and potentially, family members.

4. The All Important "Alpha Site"

Translating this vision into a working reality was the next step.

Prior to contacting venture capitalists for Series A financing, Jeff knew he had to development proof that the medical monitoring system would work as promised. To do this, he arranged a multi-month controlled study in a 100 person facility run by a large assisted living company. This company – GoodFellas -- was a billion dollar nonprofit assisted living company, one of the largest players in the industry, and known for its focus on improving resident wellness as part of its core mission. A senior executive in this company truly liked Jeff's vision and wanted to support his efforts. For Jeff, this particular company was first-rate. At various conferences, he had come to know the management and felt confident that they would be a good "alpha site" partner for testing the new technology.

Using seed money from friends and family, plus sharing some of the costs with his alpha site partner, Jeff was able to get a third party software company to

develop an initial version of the software. He also hired an outside contract medical equipment manufacturer to make a 100 bedstrip sensors.

After installing and running the monitoring system for three months, the controlled study confirmed the validity of the medical monitoring concept.

- Passive monitoring (without use of cameras) was acceptable to older adult populations and gave their family members peace of mind.
- Professional caregivers at monitored sites attained significantly higher levels of efficiency in care delivery than their control site counterparts.
- Cost of medical care for monitored patients was nearly 30% less than the cost of medical care for un-monitored subjects (where cost includes hospital and emergency room visits, doctor visits and other billable events).

The study showed the importance of customizing medical alerts for individual residents and integrating the technology with the assisted living facility's larger processes for patient intake and ongoing medical management. These results were presented to various governmental organizations, and Jeff's alpha site partner was proud of what had been accomplished.

Just as important, Jeff's selection of the 3rd party software development firm had been a good one. By the end of the study, the software had much of the necessary functionality for gathering and interpreting stream data, issuing alerts, and tracking events on a historical basis. Now, he needed to raise money to finish the job – which included remote testing of sensors from a central nursing station, integration of alerts with patient medical records, and full workflow management and reporting software to handle the human response side of the system.

5. Designing a Business Model

Jeff spent much of his waking hours floating his idea with potential investors. He had already received substantial interest from the local venture capital community. He also had also talked to several large medical device manufacturers involved in mobile medical technology. Perhaps most important to Jeff himself, his partner in the alpha site test – GoodFellas, the large nonprofit assisted living company – wanted to make an early strategic investment into the business – but only if Jeff could find other qualified investors.

Jeff had to quickly write a business plan and produce a set of realistic financial projections.

The very first question he needed to answer is how the business should make money.

There were three options:

1. License the technology to a large medical automation manufacturer, such as Philips, GE, or Medtronic. Let them take the technology to market as a new set of monitoring devices. In this scenario, these manufacturers would be responsible for developing, installing, and maintaining the software. Jeff's company would be licensing sensor technology, plus a few important programming interfaces to access information coming from the sensors. In 2010, remote medical monitoring was already very "hot" area of research and development for the large medical device manufacturers. This strategy could be a quick hit for Jeff and his scientist partner.
2. Jeff could take the technology to market as a product suite, with a configuration for each residence that includes a PC, a wireless router, and various bed strip devices with built-in wireless communication transmitters. Under normal circumstances, Jeff estimated the COGS for the entire configuration for a residence to be about \$500 (one PC, one router, and medical monitoring devices, for each room in the residence.) He also thought that an installation fee of \$250 per residence might be acceptable, based on a service technician installing and "provisioning" the system in thirty or so minutes per residence. For revenue estimation purposes, Jeff used a \$2000 per residence selling price for all the equipment, plus a \$250 installation fee. He also planned to use a financial institution to help finance purchases for customers, from which he expected to pay upwards of 5% for the service.
3. The third option was to the technology and products as a service. Working through assisted living company partners, he would charge a monthly monitoring fee. This approach could be considered as an "ADT" model (where ADT is the large global home security monitoring company that charges residents a monthly service charge plus an installation fee). Jeff was thinking in the range of \$100 a month for the service, plus an installation fee of \$250.

Importantly, in either of the last two scenarios, the nursing staff in the assisted living companies would themselves monitor the system for alerts and manage responses. The typical assisted living center was set up to do this; it already had "nursing stations" centrally located where staff took incoming telephone calls from residents. With this new technology, the nursing staff would be able to monitor real-time feeds on computer screens or mobile tablets, receive alerts alarmed with sound and color, and record their responses afterwards through appropriately designed input screens.

Jeff thought about the advantages and disadvantages of each of the approaches. One of the issues that concerned him with the services model was the longevity of the residents themselves. The average resident in an assisted living center spent less than three years there, before moving someplace else, either on earth or in heaven. To get a return on the investment in technology for each unit, his company would have to resell currently automated apartments to new residents. At the same time, the promise of recurring revenue from the same installed base of technology was very attractive. But for any of this to work, Jeff knew that he would have to make the assisted living companies his business partners. He needed to them to promote the monitoring service as part of their overall wellness plans. Fortunately, the GoodFellas alpha-site test showed that this was feasible.

6. Building a Pro Forma P&L

Jeff needed to build an initial pro-forma P&L for the business. As he started to build his model, he realized all the assumptions that he had to make in order to project revenue, expenses, and operating profit. He made a list of the following major assumptions.

6.1. Users and Uses for the Technology

- The primary users were the residents themselves, and the primary use was to monitor basic medical conditions such as heart rate, breathing, movement, and potentially weight loss and falls, all for the purposes of alerting and enabling rapid response.
- Healthcare coordinators/providers were also important uses. The system could help them better prioritize and track care across residents, as well as catch emergencies in the making.
- The loved ones or families of residents were another potential user of the system. Families have the need to communicate and understand the care being provided to their parents. Plus, loved ones often feel guilty not being able to visit their parents sufficiently nor having access to medical information for their parents.

6.2. Product Revenue Estimates

- If Jeff planned to just be a product company, he thought that a \$2000 equipment cost plus a \$250 installation fee were reasonable. This would cover the cost of goods for a PC, a router, and medical monitoring devices, together being about \$500. Financing this for residents would cost him in the range of 5%.

6.3. Service Revenue Estimates

Jeff was most intrigued by developing an ADT-like medical monitoring business. In thinking about this from a revenue perspective, he had the following questions:

- What would a customer pay for a monitoring/alert service per resident per month? What benchmark makes sense? GE's was offering a home medical monitoring service called QuiteCare with monthly charges in the range of \$120 per month. ADT for traditional home security, was another benchmark, charging \$70 per month. Jeff was thinking of a monthly service fee in the range of \$100 per month.
- Should there be an installation fee for putting in the monitoring sensors? Or, should the cost of installation be bundled into the monthly charges? While the total cost of goods sold for each installation was planned to run about \$500, Jeff thought about charging \$250 to mitigate some of the risk of a resident not surviving sufficiently long to begin to generate operating profit.
- Should Jeff charge more for aggregated reporting for health care coordinators, or bundle it into the monitoring service where ever it is adopted? His goal was to make assisted living center managers true partners in this business venture so that they would help sell the technology to new residents. Charging assisted living companies more for value-added information might be problematic in this regard.
- Should there be a loved ones portal – and how should it be priced? Would the children be resentful of being charged additional money to look at the monitoring data for their loved ones? Would the parents want their children to see such information? If he did charge for a loved ones' portal, Jeff was thinking about an additional \$10 per month per installed residence.

6.4. Market Data and Channel Partners for the Assisted Living Market Segment

While the market for assisting living centers was fragmented, there were five industry leaders that were gaining share. Which one should Jeff go after first, and then next?

- Sunset*: with 50,000 resident units, in about 500 very large facilities, which was expected to add 5,000 units per year over the next five years. This company had been known as the aggressive, money-maker in the industry.
- Erick, with only 15,000 units, but which was known as the technology leader and which planned to add 5000 units per year over the next five years.
- SingingBrook, which is the same size and has the same growth rate as Sunset: 50,000 units growing at 3000 units per year over the next five years. Large and growing, SingingBrook had been investing in new administrative systems.
- GoodFellas, Jeff's alpha-site partner, which had 35,000 units, and which expected to add 2000 new units per year over the next five years. This organization, a non-profit, had an outstanding reputation for trying new ways to improve the quality of care.
- VCare, which has 30,000 units, and is expected to add 1000 new units per year over the next five years. This was also an exceptional organization in terms of its focus on the needs of the elderly.

** These company names are disguised.*

Jeff believed that each major assisted living center would require a five year rollout to achieve national coverage. Jeff thought that given the size of these organizations, his company could start deployment in just one major assisted living network a year, reaching all five major assisted living companies over the course of six years. The up-take rate for each assisted living center company's entire patient population would be anyone's guess, but Jeff thought that 35% or more of all residents in each channel partner would ultimately be users. Over five years, this translated into 7% of all current (total) residents in each assisted living center company coming on board as new subscribers to the service each year in the five year rollout.

As an incentive, Jeff built into his model a 10% sales commission back to the assisted living center companies as an incentive to recommend the system to new residents and to train its own nursing staff on the new system.

Residents would vacate their apartments, on average after three years, due to death or simply moving to a new living situation. For planning purposes, Jeff thought that these empty units – already having monitoring -- would be sold to new residents if the system became part of the wellness program featured by the assisted living company. However, a key assumption was that current installed units would remain operational, and therefore, revenue generating. He knew, however, that this would be a point of contention with the venture capitalists! But he thought it premature and self-defeating to speculate on any sort of lapse rate for installed apartments.

6.5. Operational Cost Considerations.

Jeff also had to plan for basic operational costs. His major cost elements were:

- The R&D budget for the resident health automation/alert suite was \$2 million (a number of robust tools already exist, but the applications are all new) in the first year of the business, growing to \$3 million as a fixed cost of doing business every year thereafter. The ongoing R&D expense would be primarily for a) improving sensors and developing new ones; and b) software development. In fact, the workflow software and its linkage to patient databases were just as challenging as developing the sensor technology. Jeff estimated that this software development effort would require an ongoing team of at least a dozen programmers.
- COGS: Sensors for vibration analysis, heart rate, and weight, plus a PC and wireless router would initially come to about \$500 per residence. He expected this to actually decrease over time, but at this point, did not know how to model that decline and did not incorporate it into his cost projections.
- Installation: Jeff planned for a cost of \$250 per unit, based on 30 minutes to install devices and perform a quick check between the sensors and the wireless routers. He explored the possibility of making a major telecom a strategic partner for installation, but for now, thought he needed to have his own staff perform this function to insure quality.
- Field support: Jeff needed to develop a technical field service capability not only to perform the installations and but also to check any problems that might arise with the sensors and wireless

communications system. Jeff planned to hire six technicians a year after the first year of business, and keep hiring at that rate for the next four years at a cost of about \$60,000 a year for each person and \$25,000 to lease and stock vans with replacement sensors. These technicians would support the facilities managers in assisted living centers.

- Each assisted living company would require its own “trial” of the new system in a 50-100 person facility before rolling it out nationwide. The first year of Jeff’s venture would be focused on quickly finishing the software and running trial for the first major assisted living center customer. The estimated cost of running that first trial was \$200,000. Jeff thought that the first trial would span a full nine months, covering 50-100 residents. Each assisted living center company thereafter would need its own trial to prove efficacy, also covering between 50 – 100 residents. Jeff believed that he would become more efficient over time running these trials, completing them in six months at a cost of \$100,000 per trial. Jeff also thought his company would have “to eat” the cost of the test site in order to win the assisted living center customer’s business.
- The management team budget for this venture was set at \$1 million, covering key management roles and a few support staff. This cost was expected to grow at 30% a year first five years, which would include additional marketing, financial, and administrative staff. In addition to these traditional management roles, Jeff knew that he needed several former nurse managers to help guide future software development and to work directly with medical managers in each of the large assisted living center companies.
- Applications hosting: Jeff had a choice of building his own server environment to host the application, or to outsourcing that to a firm such as IBM, HP, or Amazon. A cost estimate for outsourcing was 7% of revenue, scaling down to 5% over five years. With several of the larger outsourcing companies, Jeff could also receive Tier 1 technical support for facilities managers in the assisted living centers.

To summarize the operational costs, there would be four major cost elements: a) the cost of goods sold (for sensors), b) the cost of installation, c) ongoing technical field support costs, and d) application hosting fees for running the monitoring server software.

Another important aspect regarding Jeff’s operational costs was that unlike an “ADT” security services company, he would not have to run a central call center to respond to patient alerts. Rather, each assisted living center would

already have a centralized nursing station at each major facility, with nursing staff on call 24X7 to respond to alerts as well as to help residents on an ongoing basis with medications and activities of daily living. Jeff planned on having his traveling technicians provide technical training on-site to the nursing staffs with respect to using the software and replacing faulty sensors in patient's apartments.

6.6. Home Health Agencies as an Adjacent Market

Jeff thought that home healthcare agencies represented an attractive, 2nd stage market segment. Their patients were by definition "at risk" and would be fine candidates for wellness automation. The largest home health agencies in 2010 were GHealth with \$1.6 billion in revenues, ACare with \$1.5 billion and PVisit with \$202 million. (These company names are also disguised.) There were three others with approximately \$100 million in annual revenue.

As noted above, this was more of a "mass market" play compared to the assisted living center market. The size of this segment was both attractive and intimidating. For planning purposes, Jeff made a few key assumptions:

- To handle the installation and service of residential units, Jeff planned to contract with an outfit such as Best Buy's Geek Squad for a fixed price of \$20 per month per resident to trouble shoot and repair faulty systems.
- One large home health care agency, with over 100,000 residents under management, had expressed strong interest to Jeff about trying the new system. The CEO of that company said that Jeff could run a trial on a hundred residents (typically over a six month period), and the following year, Jeff might expect a market uptake within this agency's patients at the rate of 2% of that population a year. That CEO also offered to introduce Jeff to other similarly sized home health care executives in other urban centers. Jeff also figured that he would have to spend \$200,000 to run a two month trial in each home health agency before launching into full scale deployment.
- Jeff and his team – while tempted by this adjacent opportunity – first wanted to get installations started with at least two assisted living companies going before starting a new trial. Jeff believed that focus was all important. At best, the home health agency work might start in 2013 or 2014.

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Sitting back at his desk, Jeff had to first select his business model – product or service-based. Then, he had to develop his revenue model, and from that, a more complete pro forma P&L. Was \$5 million Series A financing sufficient? How much more might he need for a Series B? Typically, if he raised \$5 million to get started, he would expect to raise twice that amount, or \$10 million for the next round of growth capital. For that money, Jeff suspected that he and his partners would be fortunate to still own 20-25% of the equity by the time of an “exit,” most likely in the form of an acquisition by a large medical technology or services provider. If things went really well, that might occur in six to seven years.

Would the business generate sufficient operating profit after five or six years to create the type of 10X return expected by professional investors? Exit multiples in the medical software / services arena were running at 4 times revenue and 8 times EBITDA..

It was time for Jeff to work his spreadsheets!

Appendix

Richmond, VA, April 7, 2011 - ElderAlert Systems, the leading developer of next-generation wellness solutions for care providers, announced today it was selected as a winner of the State Healthcare Innovator of the Year. The State Healthcare Innovators Awards honor organizations that have developed innovative ways to improve quality and/or efficiency in healthcare. ElderAlert won the highest award for the Healthcare Information Technology category.

"We were truly impressed with both the number and quality of the nominations we received for the 2011 State Health Innovators Awards," said the co-chair of the State Healthcare Innovators Planning Committee. "Healthcare innovation is indeed thriving in the State. Given the caliber of the nominations, the finalists and winner should be very proud. They stand out as the best of the best."

ElderAlert's advanced "smart sensor" solution supports wellness by providing insightful, information about an individual's physiological data (i.e. sleep quality, bathroom visits, activity levels and more). By regularly reviewing the information and proactively responding to trends that may indicate emerging health conditions, clinicians and caregivers can significantly improve health related outcomes.

"We are honored to receive the State Healthcare Innovator of the Year award this year," said the president and chief executive officer of ElderAlert Systems. "We are committed to promoting safety, wellness and independence for seniors. This award helps to further validate that we are continuing to create a new standard of care for seniors, whether they live in their home or in a senior living facility."