ADOPTION OF MOTION-SENSOR BASED MONITORING SYSTEMS
Developing Marketing Strategy

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EXECUTIVE SUMMARY

The purpose of the present report is to provide strategic recommendations for businesses looking to sell motion sensor-based monitoring systems, which allow caregivers to remotely monitor seniors’ activity patterns and be alerted to pattern abnormalities.

The report begins by establishing how and why marketing of such technology presents a particular challenge. Market and consumer analysis is reviewed, and indicates a number of barriers to adoption, including a lack of consumer knowledge and understanding of the technology and its value, objections and distrust the elderly have of surveillance products and products that betray their age, and the involvement of both the caregiver and care recipient in the purchase decision, with further influence provided by the care recipient’s physician.

The report continues by outlining the basis for marketing strategy, recommending that to address these and other barriers to adoption, the monitoring system be positioned as an alternative that allows the elderly to preserve independence and gives their caregivers peace of mind. The system is an alternative to loss of independence, and a more cost-effective and less obtrusive alternative to other monitoring options. The recommended target market is middle-aged, mid-high income women who provide care to persons aged 75 or older: who live independently and are relatively interested in assisted devices, but have ailing health and are at risk of accidents or memory lapses as a result of their age or mild cognitive impairment.

The report further outlines more specific marketing strategies, suggesting that (1) the product be designed to be minimally obtrusive, with features that help the elderly protect their privacy and avoid risk associated with the purchase, (2) the product be distributed online or in pharmacies (where retail distribution is financially feasible), (3) that marketing communications focus primarily on the caregiver, with a view to help him/her obtain the care recipient’s consent to installation, to establish online presence, and to obtain endorsements from media outlets, relevant non-profit organizations, and doctors.

The report concludes with remarks on establishing system price points and a cautionary note, advising readers that demographic changes are sure to make the findings in the study less relevant to new generations.
PART I: UNDERSTANDING THE TECHNOLOGY AND ITS IMPACT

Canadians are aging on an unprecedented scale. The size of the Baby Boomer generation and medical advances that enable longer life are dramatically changing the demographic fabric of society: “in 2011, an estimated 5.0 million Canadians were 65 years of age or older, a number that is expected to double in the next 25 years to reach 10.4 million seniors by 2036. By 2051, about one in four Canadians is expected to be 65 or over” (Canadians in Context – Aging Population, 2014).

Such a fundamental and relatively rapid shift in our population structure confronts us with many new challenges. A primary and much-discussed issue is containing the cost of care for aging individuals while ensuring their continuing health, dignity and independence. Increasingly, it appears that technology is the best tool in our kit to address this seemingly insurmountable problem.

“The Internet of Things,” the collective term for physical devices connected to the Internet using networked sensors, promises us the possibility of improving elderly care while maximizing the independence experienced by our seniors. In particular, the Internet of Things enables telecare, or remote monitoring “technologies that facilitate independence and enhance personal safety” (Robinson et al 2013, p. 366). Fundamentally, the premise of motion sensor-based monitoring technology is allowing

“Do not deprive me of my age. I have earned it.”
- May Sarton, “The Poet and the Donkey: a Novel”
caregivers to “keep tabs [on seniors] from afar” (Bruzek 2014), monitoring daily activities and alerting the caregiver to pattern abnormalities.

The system consists of several small motion detectors, which transmit data to a single hub that’s plugged into an electrical outlet and connected to cellular data networks or the Internet. The hub then transmits data from the sensors to a provider’s server, where it is analyzed by software algorithms and pushed to dashboards accessible by caregivers. Software compares continuously compares data it receives to regular activity patterns, which it learns over a short period of initial use. Deviations from normal patterns are detected and reported to the caregiver.

Motion sensors are identical, but can have a number of applications. For example, a sensor attached to the refrigerator door can track when the senior opens the fridge and alert the caregiver if this is not done, suggesting if and when the senior ate. A similar sensor on the door of a medicine cabinet can suggest when pills were last taken, or alert the caregiver if they were not. There are a number of possibilities — virtually anything in a person’s home can be outfitted with sensors that allow the caregiver to track when doors are opened and closed, or when a person walks by, into or out of an area.

Objectively considered, assisted living technology offers extensive value to its users: it can help seniors stay in their home longer, which research by Good Robot (producer of motion sensor-based monitoring systems) indicates is a key concern for the group (A.
Majer, personal communication, November 27, 2013). In theory, this sounds like a feasible solution. In practice, companies like Toronto-based Good Robot, for all the usefulness of their products, cannot achieve any significant market penetration: the technology is simply not adopted, despite “significant interest” (Bruzek 2014). The problem, then, must be rooted in subjective perceptions of the product, rather than faults with the practical product itself.

To help address the challenge in adoption of assisted living technology, the focus of the present report is to:

1. Explore and understand the mechanics of the decision about the extent and nature of the provision of care as a person ages,
2. Explore and understand the participants in the above-mentioned decision and their motivations,
3. Outline the barriers to adoption of motion sensor-based monitoring systems on the basis of the above findings, and
4. Recommend strategies for businesses in the space to increase adoption of their remote activity-monitoring solutions.
As people age and health declines, levels of independent functionality decrease, as well. This raises the need for the individual and other related parties to consider the decision of how care will be provided to the older person to ensure that all of his/her needs will be safely met.

Decision participants must decide on:

1. The extent and type of care that must be provided,
2. Manner of care provision,
3. Who the specific care provider will be.

The nature and extent of care that is required is determined primarily by “need factors”: “subjective and objective criteria that determine the older person’s need for care,” with a particular emphasis on objective needs rather than the elderly’s subjective assessment, as “the elderly are not always aware of their own frailties, or they do not admit them in an effort to defend their self-concept” (Mathur and Moschis 1999, p. 78). Typically, the older the individual, the greater the objective need for, and provision of, care (Mathur and Moschis 1999, p. 82). Marital status of the senior also impacts the amount of care to be provided – generally, married elderly receive less care than unmarried counterparts (Mathur and Moschis 1999, p. 82).
Closely tied to the decision on the nature and extent of care to be provided is the
decision of the manner of care provision. At this time, the three primary modes of care
provision are:

(1) Via a primary caregiver, typically a family member or nurse, who visits or lives in
the senior’s home
(2) Assisted living facilities
(3) Nursing homes

A primary caregiver is able to provide basic and instrumental care, i.e. help with basic
activities of daily living, as well as instrumental tasks such as shopping, transportation,
financial planning, etc.

Assisted living facilities are a form of residential solutions that allow elderly persons to
“live independently with some supportive measures” (Sykes 2000, p. 118). The senior
typically lives in a private apartment, maintains control over his/her schedule and the
facility is paid to provide some care services while foregoing others. The inherent ability
to choose what to do on one’s own and when to receive care and have control over
one’s schedule is central to the senior’s perception of independence (Carder and
Hernandez 2004). This perception is actively cultivated by symbolism of facility
communications, which use words like “‘consumer’ and ‘service agreement’ rather than
‘patient’ or ‘chart’” (Carder and Hernandez 2004, p. S61). Overall, then, “as a consumer
entity,” an assisted living arrangement provides product (e.g. private apartment) and
service (e.g. assistance with personal care) plus the added symbolic values of
independence, choice, risk, and privacy, in exchange for private or public monies” (Carder and Hernandez 2004, p. S64). The unique position of the assisted living facility as “a program of care and service that falls between independent living and long-term care” (Thornton 2014) and the complex, negotiated nature of what services can and should be provided, means that there are “no reasons to expect that older persons would know how to be consumers of assisted living” (Carder and Hernandez 2004, p. S65). Furthermore, assisted living facilities typically do not accept “consumers requiring ongoing or unpredictable skilled nursing care… or consumers who ‘wander’” (Carder and Hernandez 2004, p. S62). Accordingly, the decision to move into an assisted living facility has a “brief timeline… if the marketing message reaches the consumer too soon, their reaction is ‘I’m not ready yet.’ If the message reaches the consumer too late, the individual may need a higher level of care than that traditionally provided in an assisted living environment” (Thornton 2014). Once the resident moves into a facility, the facility is to expect relatively high rates of attrition as the resident’s health deteriorates and becomes incompatible with the facility (Thornton 2014).

Whereas personal caregiving and assisted living facilities cater to individuals with moderate levels of impairment in activities of daily living, those requiring extensive, ongoing or specialized medical care are better suited to long-term care: nursing homes, where the individual lives in a structured environment that permits virtually no participation in care, scheduling or living choices on his or her part.
In addition to living arrangements, wearable medical alert systems become an option for seniors living alone. These allow an elderly individual to hit a button in case of emergency such as a fall, and have the device alert a dispatcher who contacts emergency services and caregivers.

Furthermore, there are another two monitoring solutions in the market: video monitoring, whereby video cameras are installed throughout the senior’s home and the video is accessed by caregivers, and security systems, whereby the home is outfitted with various detectors and alarms (smoke detectors, temperature detectors, door and window monitors), and abnormalities are reported to a dispatcher, who contacts caregivers in the event of abnormalities.

PART III: UNDERSTANDING THE PURCHASE DECISION

Market research on the mechanics of the decision to purchase motion sensor-based monitoring systems is scarce. However, C.R. Bruce of the Center for Medical Ethics and Health Policy at Baylor College of Medicine in Houston, Texas, has developed a framework for making an informed decision about the purchase of such technology (2012), in recognition of the fact that “it is difficult to make an informed decision about purchasing an intervention that is new, especially when the technological limitations and benefits are uncertain” (Bruce 2012, p. 318). While individual consumers may or may not follow the entirety of his prescription, it is recommended that technology providers
take the view into account to prepare to withstand even the most extensive customer scrutiny.

Bruce argues that when selecting either of the three available types of monitoring solutions (video cameras, security systems and motion sensor-based monitoring technology), the individual facilitating the purchase decision (typically a physician, nurse or social worker) should (1) provide information, (2) ensure comprehension, and (3) ensure voluntariness with respect to the decision.

Information should be provided with respect to the technology as presented on the company website, and supplemented with information on “costs or additional expenses for customizable features, assessments, training, and follow-up,” and “data output limitations and confidentiality” (Bruce 2012, p. 320).

The facilitator should next assess the ability of the elderly individual to comprehend the nature of the technology and decision. This is likely to be a relatively minor issue as individuals who are able to live independently only with the assistance of monitoring are unlikely to be severely cognitively impaired, though some impairment may exist as a result of, for example, minor memory lapses (Bruce 2012, p.320).

Voluntariness should be ensured because motion sensor-based monitoring technologies “could be regarded as threatening older individuals’ voluntariness by creasing a sense of disempowerment and loss of independence. Such technologies
might make some individuals feel as though they are being treated like teenagers with curfews” (Bruce 2012, p. 320).

If information provision, comprehension and voluntariness is assured, evaluation of specific product offerings should focus on assessing:

(1) The effectiveness of the technology and its limitations,

(2) The obtrusiveness of the technology, i.e. the extent to which the technology is “both undesirable and physically or psychologically prominent according to a user's subjective perception, including (a) physical dimensions, which encompasses characteristics such as physical discomfort, dependence, and movement impediment; (b) usability, including lack of user friendliness or demand on time/effort; (c) privacy dimensions, which refers to a perceived invasion of personal information or perceived violations of physical self, and (d) functional dimensions, demonstrated by perceptions of malfunctions or lack of usefulness.” (Bruce 2012, p. 322).

(3) Impact of the technology on the user’s quality of life, which is a combination of the effectiveness and obtrusiveness of the device, as well as “the impact the monitoring technology has on someone’s independence, self-esteem, or daily tasks” (Bruce 2012, p. 323).

The implication of this informed decision making model on technology providers is that by providing tools and information necessary to assess the technology, and ensuring the product design overcomes concerns of voluntariness and obtrusiveness, a company
can ensure that its product successfully passes the most stringent decision making processes leading to purchase, and create a positive image of transparency and trustworthiness valued by elders. Specifically, the company should:

- Avoid and disclose any hidden or follow up fees
- Be explicit and specific about technology benefits, to avoid misconceptions of technology capabilities
- Ensure and communicate about data confidentiality

A discussion of how the company may create products to overcome concerns over voluntariness and obtrusiveness follows in the section on Implications for Product Design.

**PART IV: UNDERSTANDING THE CONSUMER**

Due to the novelty of the field, there is limited research on decision-making models in the realm of assisted living technologies. Speaking more broadly, however, research indicates that “medical and housing decisions faced by the elderly usually involve more than the provider/client dyad,” as older persons’ “declining health may increase willingness to subcontract decisions to others” (Gentry et al 1995, p. 650). Typically, the older person’s children and physician are the third parties most relevant to the decision-making process. The role of third parties may vary from information provider, to advisor, to sole decision-maker. The roles and characteristics of all parties involved is discussed below.
THE CAREGIVER

Caregivers are primarily mid-high income middle-aged women, though provision of some care tasks varies by gender.

In 2012, 28% of Canadians aged 15 years of older were caregivers, providing care mostly in connection with age-related needs. 54% of these individuals were women. Typically, the primary caregiver is the senior’s eldest and/or geographically closest daughter, whom others expect to assist her parent(s), and who internally sees caregiving as a moral obligation (Gentry et al 1995, p. 651). The majority of caregivers (44%) was between the ages of 45 and 64.

Caregivers of parents typically spend four hours a week on providing care, though 17% of women and 11% of men spent more than 20 hours a week on these tasks, and a tenth of caregivers spent 30 hours or more. 28% of caregivers were “sandwiched”: they were providing care to parents or parents-in-law and also raising children. Most “sandwiched” caregivers were women between the ages of 35 and 44.

Caregiver tasks vary by gender: it was found that two thirds of women provided assistance with tasks inside the house (e.g. meal preparation and house work,) as compared to 34% of men (Sinha 2013). Similarly, 34% of women, as compared to 11% of men, helped with personal care tasks. The trend was reversed in relation to tasks outside the home (e.g. house maintenance and outside work), and there were no gender differences observed in instrumental tasks such as shopping and transportation.
Emotional support was a key activity all caregivers engaged in, with 88% of caregivers reporting “spending time with the person, talking with and listening to them, cheering them up or providing some other form of emotional support” (Sinha 2013).

Most caregivers (31%) reported an annual household income of $100,000 or more, with a further 22% reporting an annual household income of $60,000 to $99,999: “in fact, caregivers were more likely than non-caregivers to report an income of $60,000 or more” (Sinha 2013).

*Caregiving is a rewarding and relationship-building experience, but it also leads to significant feelings of stress, worry and anxiety: caregivers search for “peace of mind.”*

The caregiver remains an integral part of family structures: “despite demographic and socioeconomic changes, values of the family caring for the elderly have not eroded” (Mathur and Moschis 1999, p. 74). In 2012, Statistics Canada found that seven out of ten caregivers “expressed that their relationship with their care receiver had strengthened over the course of the previous 12 months,” and 9 out of 10 caregivers described their experience as “rewarding” (Sinha 2013).

At the same time, 30% of those caring for parents “reported at least five symptoms of psychological distress, such as depression, feelings of isolation and disturbed sleep” (Caregivers in Canada 2012, 2013). 28% of caregivers found providing care “somewhat or very stressful” (Sinha 2013) and 19% indicated that their “physical and emotional health suffered in the last 12 months as a result of their caregiving responsibilities”
Feelings of stress, inability to cope, and adverse health effects were “magnified with the intensity of care”: the more hours a week were spent providing care, the greater the likelihood of stress and worse health (Sinha 2013). Overall, “despite coping well with caregiving responsibilities, caregivers report often feeling worried or anxious” (Sinha 2013). Women were found to be more prone to health problems, as 21% of women, as compared to 7% of men, reported health problems related to caregiving (Cranswick 2003). Overall, “physical strains of caregiving raise concerns about ‘caregiver burnout,’” which has negative impacts on both the caregiver and receiver, particularly if the latter’s needs are no longer being met (Cranswick 2003).

Feelings of worry and anxiety, in particular over the care recipient’s health and safety, were echoed in the netnographic analysis conducted by the author upon study of Amazon reviews of the Lively motion sensor-based monitoring system. Six of fifteen caregivers who reviewed the product praised its potential to provide “peace of mind” and relieve anxiety of caregivers, especially those separated from care recipients by distance (Customer Reviews: Lively Activity Sensors for Living Independently, 2014) (emphasis added):

- “…the peace of mind [the Lively system] gives to loved ones is easily worth the monthly fee”
- “…as long as they’re [the care recipients] up and moving about doing their daily activities, you’ll get a little peace of mind knowing that everything appears to be fine.”
• “My siblings and I all live far away and this product has relieved much of our anxiety between phone calls as my parents do not have Internet service.”

• “Many of us either live far from our parents or know someone who does and this revolutionary technology can provide some peace of mind, despite the miles.”

• “This system has finally given us some peace of mind without being intrusive and at a reasonable cost.”

• “With Lively I can cave some peace of mind knowing my Mother’s daily activity.”

• “My mother in law is independent at almost 70 year old age. Yet, I have to admit that I always worry about her because she’s diabetic. I don’t want to imagine any worst case scenarios in terms of her diabetic health condition, but bad things can happen when you’re living independently.”

Virtually all caregivers (96%) ensured that the care recipient was doing well by calling or visiting (Sinha 2013), and it appears that reviewers felt that the Lively system accomplished this goal with minimal intrusion (Customer Reviews: Lively, 2014).

*Caregivers face time pressures and career obstacles.*

Caregivers often cited having less time to spend with their children, spouses, friends, on social activities, and relaxing or taking care of oneself (Sinha 2013). Caregiving was also found to sometimes have negative impact on paid work: 60% of caregivers were employed, and about 43% of caregivers found that caregiving disrupted their work routines, resulting in lateness, leaving early, and taking time off during the day (Sinha
Long-term consequences were also present, as some caregivers reduced hours and postponed or forewent career advancement opportunities (Sinha 2013).

Caregivers become consumers of caregiver-related products/services, and influencers of care recipients’ consumption decisions.

More than a third of caregivers report extra expenses due to their responsibilities, and two thirds of these persons spend more than $100 per month on caregiving (Caregiver Facts). This is in addition to indirect market contributions resulting from the caregiver’s influence of the care recipient’s consumption.

Having to perform the role of a caregiver also forces the caregiver to shop and look for information in other product/service categories, and to “make greater use of information sources – both formal and informal, to enable oneself to learn about availability of products and services and how to acquire them, and help the older person consume them” (Mathur and Moschis 1999, p. 79)

When it comes to making the care decision, studies have found that 82% of older consumers seek their children’s input into care and housing decisions, while 51% of nursing home residents surveyed indicated that the decision to move into a nursing home was made solely by the resident’s family (Gentry et al 1995, p. 650). Caregivers (children) are similarly key influencers when it comes to purchasing assisted living technologies, with 53.8% of the elderly viewing their children as a persuasive source of information (Robinson et al 2013, p. 369). Children increasingly become important
decision-makers as their parents age: “some studies in the independent living industry, for example, have shown that from age 75, joint decision-making [with children] steadily increases to over 80 percent of the time” (Meiners and Seeberger 2010, p. 307).

THE ELDERLY CARE RECIPIENT

_Elderly care recipients in Canada are largely women living alone._

The percentage of men and women aged 65 or older who live in institutions has steadily declined from 1981 onwards (Cranswick 2003). This corresponded to an increasing number of seniors living at home and receiving care in the community. As a result of women’s longer life expectancy, more elderly women than men are care recipients (Cranswick 2003).

Similarly, as a result of longer life expectancy and the tendency for men to marry younger women, more women than men who received care lived alone, rather than with a spouse who provided care. In 2002, 52% of women who received care and were aged 65 years or more lived alone, as opposed to 18% of men in the same situation (Cranswick 2003). The trend of living alone was even more prevalent among the “oldest old”: 62% of women aged 85 who received care lived alone, as well as 24% of men (Cranswick 2003).
Elderly individuals experience psychological challenges in dealing with aging.

Overall, aging is a significant change for an individual, and research suggests that individuals who have aged “may suffer from inadequate socialization into roles assumed in later life” (Gentry et al 1995, p. 649). The elderly persons’ self-image and self-concept is inconsistent with the objective reality of their age and health status: the elderly consistently feel that they are younger and healthier: studies show that “even the majority of 70-75-year-olds do not describe themselves as seniors” (Meiners and Seeberger 2010, p. 297). The difference between this “feel” age and actual age is between 7 and 15 years, where the person typically feels younger than s/he is (Meiners and Seeberger 2010, p. 297). Women are somewhat more affected; the difference between their cognitive (perceived) and actual age is roughly a year greater than that of men (Meiners and Seeberger 2010, p. 296).

The discrepancy between cognitive and chronological age means that older consumers, especially those who are healthy and active, don’t necessarily identify with people their own age (Bradley and Longino 2001, p. 20), and are offended by stereotypical portrayals of the elderly in the media (Bradley and Longino 2001, p. 19). Individuals between 64 and 75 years of age, who are healthy, wealthy, and active, are especially likely to be offended (Bradley and Longino 2001, p. 19). Older individuals “drive their sense of identity in later life from the achievements of the past and what remains to be accomplished in the future, rather than from a set of stereotypical and usually negative attributes of “old age” (Bradley and Longino 2001, p. 20).
As a result of poor socialization, a younger cognitive age, and desire to preserve the younger self-concept, the elderly usually resist products that symbolize age. As an example, even though seniors would frequently purchase baby food for their own consumption, a Heinz line of pureed “senior foods” failed miserably: “older people were comfortable buying baby food because anyone observing their purchase in the store could conclude the food was intended for a grandchild. However, the senior foods held less fascination for mature consumers because these products symbolized frailty and helplessness” (Bradley and Longino 2001, p. 19). Companies are, therefore, recommended to “develop products that meet the unique needs of the elderly without becoming a visible emblem of age that others can see” (Lunsford and Burnett 1992, p. 58).

*Elderly individuals have different value systems and consumption motivations.*

According to Maslow (1968), “at higher stages of maturation people reflect ‘polarities and oppositions’ in their behavior; strive to simplify their lives’ experience changes in values; become more autonomous, and avoid extremes” (Wolfe 2004/2005, p. 16). Further research supports the presence of a shift in values. As individuals age, they become less materialistic and more interested in self-actualization (Wolfe et al 2003): “in comparison to younger counterparts, older individuals are especially likely to be motivated by some combination of the following subjectively derived values: autonomy, social connectedness, altruism, personal growth, and revitalization” (Bradley and Longino 2001, p. 20). Successful marketing campaigns in the past have focused on a portrayal of later life as “a time for revitalization and growth” (Bradley and Longino 2001,
Older consumers were found to especially respond to “products and services that serve as a ‘gateway to experiences’ and that are essentially consistent with the mature consumer’s values. That is, the product or service is not an end in itself, but a pathway to a positive emotional experience and deeper connection to others or the self” (Migliaccio 2004/2005, p. 22).

Consumer behaviour changed along with changing values. As they age, consumers do not necessarily become wiser, but they “tend to have more available time to make purchase decisions,” are “life-savvy and, for the most part, research well” (Meiners and Seeberger 2010, p. 306). They ask lots of questions, expect offers to be “simple,” and look for authenticity (Meiners and Seeberger 2010, p. 307). They are brand loyal, and “… want to be acknowledged and taken seriously as competent customers; behaviour towards them must not be characterized by prejudices and clichés” (Meiners and Seeberger 2010, p. 307).

The elderly are reluctant purchasers of remote monitoring technologies.

Though motion sensor-based monitoring technologies are novel and have not been studied extensively, the experience of Auto TeleCare, an automatic daily telephone service for people living alone, may shed some light on consumption of telecare technologies by the elderly. The service would automatically call the elderly person every day and tell him/her a joke; if the individual did not respond, “staff would call the given list of contacts to check on the client’s welfare” (McMahon 2005, p. 71).
Auto TeleCare’s research indicated that the group of seniors living alone experienced three main emotions: “worry, depression and fear of dying alone” (McMahon 2005, p. 72). Customers indicated that they signed up for the service to obtain assistance and notify others if they were injured or dead. They were also motivated by the desire to not be a burden on loved ones, have a laugh and be involved in something, and ensuring that if something happened to them, others would be notified quickly so their pet(s) could be taken care of (McMahon 2005, p. 72).

Furthermore, Auto TeleCare found that customers who stayed with them after the initial trial were 75 years old or older. Younger consumers, they found:

“...saw themselves as ‘young seniors’ and not in need of our service... this young seniors group had mixed feelings about any in-home help services. They were torn between not wanting to be a burden on family and friends while finding it hard to accept that they might need help to live at home. These mixed feeling were hard to face for most people and if feeling pressured they avoided the problem totally.”

The business was ultimately liquidated as Auto TeleCare was unable reach individuals aged 75+ on its marketing budget.

Similarly, an analysis of Lively reviews indicates that its system was purchased for individuals who are quite old, but are still, and want to remain, independent, without having to tolerate obtrusive devices or overt monitoring.
The reviews indicate that the system was used for (Customer Reviews: Lively, 2014):

- “My nearly 70 year old mother”
- “My 96 year old Dad and 88 year old Mom who still live independently in the three story home that we all grew up in and which they refuse to leave.”
- “My parents who are in their 70s”
- “My 91 year old mother.. who lives alone, is very independent and won’t agree to overt monitoring.”
- “Got this to help my 88 year old mother stay in her home as long as possible”
- “This is wonderful activity tracker for the independent elderlies. My mother in law is independent at almost 70 year old age.”

_Elderly consumers vary and cannot be grouped into a single market segment._

Senior citizens are a remarkably diverse group, and should not be “stereotyped as a unique segment of low net worth individuals dependent on their children’s income” (Meiners and Seeberger 2010, p. 294). While “there might be the phase of life called ‘Age,’ … there are no typical old people” (Meiners and Seeberger 2010, p. 298).

A primary basis of segmenting the elderly consumer market is the cohort: “an aggregate of persons in a given population who were born within the same time frame” (Lunsford and Burnett 1992, p. 60). Broadly, suggested cohorts are those of individuals aged 55-64, 65-74 and 75+: individuals in each cohort “are likely to share similar values, attitudes, and lifestyles” (Lunsford and Burnett 1992, p. 60). A similar cohort approach is endorsed by Meyer-Hentschel and Meyer-Hentschel, who advocate for a cohort
approach as “an initial sensitization – but not a final market segmentation” (Meiners and Seeberger 2010, p. 300).

A wide variety of segmentation frameworks was proposed to segment the market of individuals aged fifty years or more in addition to the cohort approach. They surely have some specific applications, but “many of the new approaches do not necessarily provide new insights” (Meiners and Seeberger 2010, p. 298). With all segmentation frameworks, however “cognitive age is a driver,” suggesting marketers should segment the population based on how old it feels (Meiners and Seeberger 2010, p. 300). Individuals should, therefore, be segmented based on their cohort, with further segmentation based on subjective age and “gerontographics.”

“Gerontographics” is an approach to segmentation that is “similar to that of psychographics or lifestyles, but it focuses exclusively, and in much greater detail, on older adults’ needs, attitudes, lifestyles, and behaviors… consider[ing] the multiplicity of dimensions relevant to aging in late life… [including] factors associated with biological aging as well as social and experiential aging… external circumstances or events in late life which can produce variability in older adults’ behaviour” (Moschis 1992, p. 19). The extensively tested model divides the elderly into four segments (Moschis 1992):

1. Healthy hermits, who “are in good health, psychologically withdrawn from society, concerned with day-to-day tasks, and they tend to be employed; they have few social contacts and little interest in staying active” (p. 20);
2. Ailing outgoers, who “tend to be health-conscious and in relatively poor physical
condition. However they are socially active, unlikely to change their lifestyle because of their age, interested in learning and doing new things, and retired… they have strong needs for information and domestic-assistance products and services" (p. 20);

3. Frail recluses “tend to be in poor health, inactive, socially isolated, and psychologically withdrawn from society… they are more security conscious… [and] desire mainly physical protection” (p. 23);

4. Healthy indulgers are “in rather good health and are independent, active and relatively wealthy; they are socially ‘engaged,’ want the most out of life, and are not hesitant to indulge themselves” (p. 23).

Gerontographic or lifestyle segmentation as it applies to openness to new products, experiences and innovation is particularly relevant to marketing new technologies, where lifestyle segmentation may be helpful in finding early adopters (Lunsford and Burnett 1992, p. 57).
Elderly consumers experience distinct barriers to technology adoption.

Finally, elderly consumers also differ in the way they relate to and adopt new technology. Failure to acknowledge and overcome senior-specific adoption barriers is “well-illustrated by estimates of new-product failure rates that reach as high as 90 percent” (Lunsford and Burnett 1992, p. 54). As discussed by Lunsford and Burnett (1992), the most major barriers to adoption of new technology by seniors are:

1. The product is not compatible with their physical abilities and physiological limitations, such as age-related reduction in vision capacity, touch sensitivity, and muscle strength.

2. “Elderly individuals have been found to adopt innovations only if they perceive a clear benefit in the new product”; however, a number of recent innovations have been geared towards saving time (p. 56). The elderly have not been responsive to time-saving technologies, as in contrast to younger consumers, “the elderly often seek to fill idle time” (p. 56).

3. Inconsistency of the technology with the senior’s self-image. Failure to recognize that the elderly’s self-image is that of a younger and healthier person leads to portrayal of the elderly as “feeble an out-of-touch,” or to the creation of products that become “symbols of age” that are “inconsistent with the self-image of the elderly” (p. 56). Both negative portrayals and becoming a symbol of age leads to lack of adoption.

4. Inconsistency of the product with enduring cultural values: “the behaviour of elderly consumers is a product of their strong, enduring values, formed over
a lifetime of experiences,” which for today’s elderly, include events such as WWII. As a result of shared cultural experiences, a number of today’s elderly value thrift, hard work and loyalty. Advertising portrayals that jeopardize these values are negatively received. Additionally, the ethic of hard work and loyalty leads to brand loyalty among many seniors.

Finally, extensive research shows that the elderly are more cautious consumers, and the presence of risks discourages them from trying new products, especially if the purchase is an involved, complex decision. The cautiousness “is due, in part, to the difficulty elderly consumers have in evaluating information on new products and sorting out relevant information from a cacophony of data, [which] leads to frustration and poor retention of information” (p. 57). Consumers are thus concerned with physical risk (risk to life and limb), economic risk (present if the product is a significant financial investment) and functional risk (risk that the product will not perform as desired).
THE PHYSICIAN

Physicians are perceived as authorities on matters of care provision.

In the broader care decision context, the physician’s primary role is perceived differently by patients and their relatives, and may vary from one situation to the next. When it comes to the nursing home decision, patients believe that the physician decides whether the move is necessary or not, while relatives see the physician as merely providing information on particular options (Gentry et al 1995). In every case, both groups acknowledge the physician’s major role in the care decision and believe that he/she should reduce uncertainty about what should be done (Gentry et al 1995, p. 657). Older individuals are more likely to “select the doctor as a decision maker, are more likely to accept the doctor’s recommendation of going to a nursing home (without getting a second opinion), and are more likely to see the physician as having the primary role in the nursing-home decision” (Gentry et al 1995, p. 658). Overall, the physician is seen as an authoritative figure (Gentry et al 1995). The general consensus among patients and their caregivers is that physicians “play a major role in the initial decision to move into a nursing home, and that they play a diminished role in the choice of a specific nursing home” (Gentry et al 1995, p. 650).
Physicians are key information providers about monitoring technologies, though they may not be equipped for this role.

The authoritative role of the physician applies in the monitoring technology consumption decision, as well. Existing research indicates that the physician plays an instrumental role in the information gathering stage. When it comes to provision of information on assisted living technologies, respondents perceived that the most “valued and persuasive” providers were physicians (63.4%), followed by children (53.8%), partners (47.2%), nurses (21.3%) and finally friends (12.3%) (Robinson et al 2013, p. 369). The physician was also not only the most persuasive, but also the most frequently used source of information on assisted living technologies: 53% of respondents to a national survey mentioned a physician or other healthcare professional as a source of information, followed by family and friends (15%) and vocational rehabilitation counselors (13%) (Robinson et al 2013, p. 369).

At the same time, more than two thirds of physicians self-reported having nonexistent, or only foundational, knowledge of the assisted living technologies that are available in the market (Robinson et al 2013, p. 371), and an American Consumer Assessments study found that “a large portion of people, [especially those between 70 and 90 years old], do not have current information on available assistive devices” (Robinson et al 2013, p. 369).
Physicians must navigate complex emotions in limited time frames.

The interface between the caregiver and the physician further complicates the physician’s role in care decisions. Caregivers view themselves as quasi-healthcare practitioners – physicians’ colleagues – individuals who have researched and can help manage the patient’s unique situations. Physicians, on the other hand, see caregivers as substitute patients – sources of information about patient activities and wellbeing (Gentry et al 1995, p. 653), which can lead caregivers to be dissatisfied with their role in the care process. In the event that a care decision is made that the patient does not welcome, caregivers may shift blame for the situation on the physician: “the doctor’s authoritarian role [may be] what helps all parties accept the realities of the situation” (Gentry et al 1995, p. 654). The physician may thus have the role of reducing dissonance once the decision is made (Gentry et al 1995).

When care concerns arise, the physician may find him/herself dealing with emotions and misconceptions of all involved: with “the illusions held by adult children as to the feasibility of care giving, as well as the more justifiable determination on the part of the elderly to maintain their independence” (Gentry et al 1995, p. 659).

Canadian physicians also find themselves to be pressured for time during visits: they aren’t able to spend prolonged periods of time discussing various care options with patients (J. Chopra, personal communication, November 27, 2013).
PART V: DEVELOPING THE BASIS FOR MARKETING STRATEGY

POSITIONING

Positioning Relative to Existing Options

The technology is unable to replace nursing home care or medical alert systems, but is able to serve as a complement to the option of assisted living and personal caregiving. The technology presents itself as a tool that caregivers can use to be alerted to abnormalities in the care recipient’s routines in order to optimize care. Caregivers who are able to frequently check on the care recipients using the technology can provide visits and calls that are better timed: they can check in on short notice should there be unusual activity, or forego a planned visit if everything is in order. This can both increase the quality of care and reduce costs.

The technology may be a complement to medical alert systems, as well. Telecare technologies do not alert caregivers of immediate emergencies, but may expose less obvious signs of ill health, as when the senior does not leave the home or eat on time, as well as situations where the senior lost consciousness and was unable to press an alert button, which the caregiver may note when s/he is alerted that the elderly person missed key daily activities.

Finally, motion sensor-based monitoring technologies are the least obtrusive and expensive of available monitoring solutions (video and security systems). Though
motion sensor data is less detailed than that obtained through a video, it is also significantly less intrusive of privacy and more likely to be tolerated to the elderly for this reason.

Consumer reviews of Lively (2014) consistently applaud the technology’s (1) unobtrusiveness, (2) passive nature that does not involve overt monitoring or wearing life alert systems, which elders resent, and (3) help in relieving caregivers’ anxiety, and allowing care receivers to remain independent.

**Consumer Reference Points**

Marketing novel products is a particular challenges because consumers generally do not have a relevant point of comparison which they can use to evaluate the relative benefits of the new product. We can easily discern between incremental innovations, but may be confused when asked to assess the value of an innovation that is disruptive. A classic example from history is that while we may have known that a stereo with better sound quality is preferable to one with worse sound, we had to be explained why a Sony Walkman is a valuable product. Because of human difficulty in judging the absolute value of things (Ariely 2009), failure to establish a relevant comparison point for a new product may result in the product appearing alien or intimidating, leading to a negative purchase decision.

Accordingly, motion sensor-based technologies must be placed into the context of existing market options. In this regard, two considerations are relevant: (1) monitoring
technology is not widespread, and (2) at the same time, different types of monitoring technologies exist.

Therefore, motion sensor-based monitoring systems should be compared to other options on two dimensions:

(1) The technology allows the elderly person to avoid moving in with family or into a facility where s/he can be observed personally (it is better than non-monitoring);
(2) The technology is significantly less expensive and intrusive than video and security systems (it is better than other forms of monitoring).

It must also be noted that since the product is at the beginning of its life cycle, consumers have no knowledge of the entire category and competition for market share is not yet relevant. Accordingly, at this point in time, a newly introduced product should not be positioned against direct competitors, which are, in any event, few and far between.

**Parallel to Assisted Living Facilities**

Overall, motion sensor-based monitoring technology provides symbolic value akin to that of assisted living facilities: it is intended to provide maximum independence while optimizing the level of oversight and support to be offered to the elderly person. Accordingly, the technology can be expected to be subject to a number of the same considerations as assisted living facilities:
(1) The monitoring system is similarly well-equipped to provide the symbolic value of independence, which should be considered in product design and communications. Independence is promoted because the technology allows for passive monitoring, reducing the number of intrusive check-in calls and visits. Calls and visits that are made can focus on relationship building rather than extensive discussion of the person’s health and activities,

(2) As with assisted living facilities, there is no reason to expect that the elderly, their caregivers or other decision participants would know how to consume the technology product/service. Consumer education must be a key pillar of any marketing communications campaign.

(3) The elderly using the monitoring system must be segmented based on their objective level of independent functionality, and reached at just the right time: before they require ongoing long term care, but not before they experience limits on functionality.

(4) Technology providers must budget and otherwise plan for attrition as user health deteriorates.
CUSTOMER SEGMENTATION

*The caregiver (adult child) is the most viable target consumer.*

The existence of multiple decision participants complicates the segmentation exercise and suggests the need to begin by (1) defining who the buyer in the decision scenario, and (2) developing a multi-faceted marketing communications campaign that would address the needs and desires of all decision participants, culminating in adoption of the product.

In the context of the joint decision described above and the various roles of the participants, it is recommended that the caregiver (or adult child) be targeted as the *buyer* and *active user* of the monitoring functions of the product. This is recommended since:

(1) It is the caregiver who receives the primary value of the product by obtaining “peace of mind” about the elderly person’s state of health. With a motion sensor-based monitoring system, the caregiver needn’t constantly worry about whether the elderly person is well, and need not assume the “role of a nagger” (Consumer Reviews: Lively, 2014) constantly checking in over the phone or in person to make sure that the care recipient remembered to take pills, eat and undertake other activities. With a sensor-based monitoring system, the caregiver can check on all these activities at any time, from anywhere, and without bothering the elderly individual. Phone calls and visits can be spent on discussions more productive than simple reminders.
(2) The caregiver already undertakes monthly expenses related to caregiving activities, and is responsible for much of the elderly individuals' shopping and consumption decision-making. Especially given limited mobility and/or lack of Internet skills, the caregiver is also best equipped to actually purchase the product from online or offline channels.

(3) The adult child is an importance source of new product information for the elderly, as the elderly have fewer social interactions and experience “dissolution of many relationships” (Lunsford and Burnett 1992, p. 59). Accordingly, even if the funds for the purchase come from the elderly person him/herself, the caregiver is a primary point of access to the elderly.

(4) Selling the product to the caregiver will avoid significant challenges in selling directly to the elderly, who, as a result of protection of their self-concept and younger cognitive age, are unlikely to believe that they are in need of a monitoring product.

The technology provider should, therefore, focus its efforts on reaching individuals who are most likely to be caring in some way for elderly individuals. Demographically, such persons are most likely to be women between 45 and 54 years of age, with an annual household of income of $60,000 or more. In addition, the caregiver, who would be purchasing and installing the system, should be comfortable with technology.

Further segmentation of the market, however, relates to the needs of the passive user of the technology – the elderly person who is being observed, but does not use the monitoring functionality of the product. The monitoring system would add little value in
caring for individuals who require assistance with basic activities of daily living, such as toileting or dressing, since individuals with such needs require personal care visits so frequent as to negate the usefulness of monitoring their very limited activities in between. Rather, the system should be sold to caregivers (adult children) who have parents or elderly relatives who are able to function with a high degree of independence, but because of their age or state of health, face risks in doing so. These elders are also living alone, with no one to observe them or remind them of certain activities. For example, a monitoring system could be of use in the home of an 75 year old woman who lives by herself and can carry out most activities of daily living, but must take pills regularly and is at higher risk of falls, social isolation and memory lapses, which makes it beneficial to monitor her activities to ensure that she took her medicine, got out of the house, and that she remains alive and out and about. Given the potential for the technology to track situations that arise due to memory lapses, it would be similarly suitable for individuals with mild age or disease-related cognitive memory impairment.

In particular, then, the target passive user of the technology is:

- 75 years old or older, since this group may live independently, but is at higher risk when doing so, meaning it is most in need of being monitored. Additionally, as observed in the case of Auto Telecare discussed earlier, this group is likely to be least resistant to adoption of the technology, as they are more likely to appreciate their need for it, and be subject to worries and fears
of dying or becoming injured while alone. Given the importance of cohort effects in segmentation of the elderly market, this group is expected to be relatively homogenous.

- Most likely to be (though is not exclusively) female, given that women are more likely to live longer and live alone.

With respective to gerontographic segmentation discussed earlier, it is the “ailing outgoer” group that is best target for a motion sensor-based monitoring system. A member of this group is in relatively poor health, but is relatively interested in assistive devices and new products. Furthermore, the concerns of this individual align with what the system is able to deliver: 52.81% of the group is concerned with being able to contact someone in case of emergency (Moschis 1992, p. 21). The group is also concerned with “getting useful information on things that affect” them, further reinforcing the educational goal of the proposed marketing campaign (Moschis 1992, p. 21) (see section on Marketing Communications for further details).

In summary, then, the target buyer is a female between 45 and 54 years of age, with middle to high income, comfortable with technology, who has a, most likely, female relative aged 75 years or more that lives independently, but is in ailing health and at risk of death, injury or missing key daily activities as a result of age or mild cognitive impairment.
Though the caregiver is the target consumer, the needs and values of the elderly must nonetheless be considered.

The elders’ consent is required to install the system in the home, and ensure that they do not sabotage it (e.g. throw the sensors in the trash). Accordingly, an effective marketing strategy must also focus on obtaining the elders’ buy-in into the technology. Value of the system to the senior needs to be communicated. Additionally, the product should be designed in a way that would ensure voluntariness of use and control of access to data, to be consistent with the proposed informed decision making model. A discussion of both factors follows in the section on Marketing Communications and Product Design.

Furthermore, decision influencers (the caregiver and physician) should be provided with convenient tools to communicate with their elderly care recipient about the value of the technology. The caregiver cannot be expected to forcibly install the system, or to independently invent ways to convince the elder of its benefits. If a caregiver faces significant pushback with respect to the product from the senior, s/he is likely to forego the purchase.

The physician should also be reached as s/he is an important source of information.

The physician has little personal direct involvement in the decision, but is an influential figure of authority whose buy-in is valuable to helping both care providers and recipients to consider, purchase and use the system. Accordingly, a successful marketing
campaign would reach primary care family physicians with a large number of patients who are 75 years old or more, focusing on providing them with education and tools necessary to assess the technology and recommend it to patients. The physician should be:

- Educated on the specific benefits of the technology to specific classes of patients, to persuade him/her that the technology is helpful, and to allow him/her to assess which patients the technology might benefit and when,
- educated on the benefits of the technology relative to other available care options, and,
- provided tools and materials to use to communicate information about and the value of the technology to both caregivers and elders in a short period of time (given time constraints during patient consultations)

VALUE PROPOSITIONS

An understanding of the product and the consumer suggests that the key value of the system for the caregiver lies in primarily, relieving daily anxiety about the elder’s wellbeing, by allowing to check on the senior’s activities anywhere, anytime, with any degree of frequency, and avoiding the need to constantly, intrusively check in and “nag” the elder about whether s/he has taken their medicine, ate, etc. The practical value of the system is being alerted to abnormal activity patterns, which helps ensure that the elderly person is alive, uninjured, and has seen to key daily activities. Additionally, the
system is less expensive than institutionalization, video monitoring systems or security systems.

For the care recipient, the broad value proposition is the ability to continue to live independently more safely. More specifically, this translates to:

- a greater sense of comfort and security since a caregiver will be alerted of missed activities which could be indicative of injury or death, ensuring that the individual is quickly discovered;
- minimizing the degree of obtrusiveness of monitoring (a motion sensor is significantly less obtrusive than a video camera or frequent visits from third party caregivers)
- allowing visits and calls from caregivers to be less functional (going through checklists of activities the senior carried out or forgot) and more emotionally rewarding,
- avoiding the need to wear a medical alert button, which serves a similar purpose but which the elderly may reject as a symbol of old age, and
- helping caregivers achieve peace of mind and thus relieving feelings of potentially being burdensome to the caregiver

For the physician or similar decision influencer, the value in recommending the system is improving the quality of his or her care via provision of a valuable recommendation,
and helping reduce rates of institutionalization to relieve the burden on the formal care system.

Additional practical value propositions may be created for the care recipient and physician, and these are recommended for implementation where technologically and financially feasible for the provider. These are discussed in detail in the section titled “Implications for Product Design.”

THE CHALLENGES TO BE OVERCOME

Based on consideration raised in the above discussion, there are several primary challenges which a successful marketing strategy must address with respect to all decision participants.

(1) Raising awareness of the motion sensor-based monitoring product category and establishing its value

(2) Successfully establishing reference points for the product

(3) Educating caregivers on the value of the product

(4) Obtaining older individuals’ consent to being monitored, overcoming their preference for complete autonomy and barriers to adoption of technology,

(5) Educating decision influencers on the product and getting them to recommend it

(6) Gaining consumers’ trust in the effectiveness of the technology
With this in mind, a discussion on implications for distribution, price, product design and marketing communications follows.

**PART VI: MARKETING STRATEGY**

**PRODUCT DESIGN**

Given the complexity of factors and players involved in the situation, to succeed in the space, a provider of motion sensor-based monitoring systems must carefully consider the design of its products at the core, actual and augmented levels, taking into account the experience of the passive and active users (care recipients and caregivers, respectively). Product design is an essential element of obtaining older individuals' consent to being monitored by motion sensors.

**Core Product**

The first challenge for the core product is the appearance of the sensors and the hub, which is particularly relevant to the passive user.

To obtain consent, for the care recipient, the devices must, first, not appear as a “symbol of aging” that reminds the elderly person of frailty and old age. The core product must, therefore, be aesthetically pleasing and avoid looking like a medical device. In the words of one reviewer of the Lively system, “No one wants to feel old, and having a clunky monitor/call switch hanging around your neck is like wearing a blinking neon sign that says "I AM WEAK AND HELPLESS!"” (Customer Reviews: Lively, 2014).
Accordingly, health-related symbols such as a red cross and sterile colours associated with hospitals and cleanliness (white and blue) should be avoided, as should obtrusive devices. This has evidently been a consideration in the design of the Lively system, which looks pleasing and does not create associations with medical devices.

Second, the devices must appear be minimally intrusive – they must blend into the environment. This will address considerations of home décor (particularly for the hub), as well as alleviate the perception of being constantly watched through a piece of obvious technology. One reviewer of the Lively system complained (Customer Reviews: Lively, 2014):

They [Lively sensors] are oddly-shaped blobs that may fit the aesthetic of cutting-edge graphic design, but which look out of place in the homes of people from earlier decades. My oldster is defensive about declining, and is not at all interested in being monitored, but the design is so eye-catching that it is a constant reminder that Big Brother is watching... I have thought of spray-painting them a color which would blend in to their placement, but the shapes are still odd and eye-catching. I wouldn't be surprised if they ended up in the trash.

This is a salient concern given the earlier described desire of elderly care recipients to protect their self-concept and their suspicion of monitoring systems. A technology provider would do better to design sensors that blend into the user’s routine so as to de-emphasize the nature of the object. The same reviewer suggests an appearance solution that involves camouflaging sensors as part of the object they are attached to.
The following recommendation is endorsed by the author of this report (Customer Reviews: Lively, 2014):

A much better appearance would be designs which blend in to where they are installed, such as making the refrigerator sensor look like a magnet with a slot to insert a photo of a family member, or having the keyfob accept a photo, or for example making the pill sensor itself be an organizer with a built-in sensor, rather than attached to the side of an existing pill organizer like a tumor.

This option not only makes the sensor appear less invasive, but improves the value of the augmented product, as well, by creating a secondary function of photo-holding which speaks to the seniors’ value of connectedness to others, providing pill-box functionality, etc.

For the active user, the core product is, primarily, the interface where s/he may observe the care recipient’s activity patterns and receive alerts. Here, the emphasis is on user-friendly design that logically organizes, visualizes and presents data, and provides timely alerts to changing activity patterns. As more Canadians increasingly use smartphones, it is imperative that the interface is available and optimized for use on computers, smartphones and tablets alike. Alerts, in particular, must appear on mobile devices which are always within reach.

Next, for the benefit of both the active and passive users, the technology provider must resolve two technological considerations: connectivity and sensor configuration.
Connectivity

In order to provide alert functionality, the sensors/hub must transmit data to a central destination to be later pushed to the caregiver’s portal. This can be done using cellular data networks or Internet connectivity (Wi-Fi or Ethernet cable). The Lively system utilizes cellular data networks, which allows use by seniors whose homes do not have Internet access. A portion of the monthly fee charged to the user then goes toward covering data fees. However, this can create a range of problems for those living in areas with poor or no cellular signal. Five of fifteen reviewers of Lively reported having to call customer service to find optimal locations for the hub in the home or frequently reset the hub because of poor connection. One reviewer was completely unable to use the service.

Both the Internet and cellular options thus come with pros and cons. It is recommended that a motion sensor-based monitoring technology provider offer devices with both connectivity options – cellular networks can be used in the absence of Internet access, and Wi-Fi/Ethernet connectivity can be used in areas with poor reception.

Sensor Configuration

This refers to the objects where sensors will be attached and what they will monitor. Theoretically, the system has great flexibility – motion sensors can be used to monitor the opening/closing of any door or cover, or movement in any area of the home. However, offering complete variability is problematic, given the novelty product and the
consumer’s lack of knowledge of the category. Functionality should be simple, so the consumer may be easily educated on the value of the product.

Selling a set of sensors and relying on the user to think of where they should go may result in (1) monitoring of activities that are not most useful and (2) frustration over the added layer of complexity in installation. Both of these factors are likely to result in customer dissatisfaction. Designating company experts to perform custom assessments of where the sensors should go, on the other hand, increases complexity and costs for the company. Furthermore, allowing such extensive variability in sensor use makes it difficult to communicate the system’s objective value – there are simply too many possible configurations.

Accordingly, it is recommended that like the Lively, a newly introduced motion sensor-based monitoring system come with a pack of a certain number of sensors, each labeled and designated for a certain use (e.g. pill box, refrigerator door, bathroom door, house keys, etc). The company would thus minimize installation difficulty, ensure that value is added through monitoring of key activities, and facilitate communication of the precise value of using the product. At the same time, it must be recognized that every senior might have certain unique needs. Accordingly, one sensor in the pack may come unlabeled, to track custom-set movements, while an insert would list potential uses for individuals in specific circumstances or with special health conditions (for example, it could be recommended that for a person with hypertension, the unlabeled sensor go on a blood pressure monitor to ensure they take regular measurements).
Actual Product

Installation

What the founder of Good Robot, called “installation friction” is another significant issue that must be addressed in product design (A. Majer, personal communication, November 27, 2014). Potential elderly customers he spoke with were concerned with letting people into their home to outfit it with surveillance technology – they felt vulnerable, as if they were being observed and as if they’ve lost their sense of privacy. Ease of installation is thus an important concern, and one that an analysis of Lively reviews suggests had been handled well with the Lively system (Customer Reviews: Lively, 2014).

In order to prevent the elderly from feeling as if they will be monitored via complex technology installed by a corporation and make the product more user-friendly for caregivers, installation must be simple – sensors must be easily attached to objects, with the power hub needing only plugging in (and accessing the Wi-Fi network in the case of Internet connectivity).

Accessibility

Furthermore, in keeping with informed decision guidelines discussed earlier, and to ensure that the elderly person provides their consent and does not feel like they are
giving up control over their lives and being watched, it is recommended that the extended product also have the following features:

- the ability for the elderly person to override monitoring settings and turn off monitoring functionality if it makes them uncomfortable at any point (e.g. if they want to conceal having left the home).
- The ability for the elderly person to control who has access to their data. Perhaps they need to be able to set a password which they must provide for entry by anyone looking to access their information.
- A no-contract model subscription which can be cancelled at any time if the elderly person feels they no longer want to be monitored, or if his/her health declines and there is no longer a need for the system. This also helps reduce the buyer's risk and increase the likelihood of adoption of the technology.

Additional Uses

To further reduce perceptions of surveillance and convince the elderly of the value of the product, technology providers can develop additional product uses or associated services, so the elderly person being monitored benefits from the exercise, as well, instead of being a passive subject observed by a caregiver. Lively has thus, very appropriately, provided value to the elderly person and appealed to the values of connectedness and relationship-building by adding its LivelyGram service to its monitoring packages. The service allows the elderly person's family to add photos and updates from their social media channels or phones to their Lively accounts, and the
content is assembled into a booklet every two weeks which is mailed to the elderly individual.

Two potential additional uses for the technology could be to provide regular printouts of activity patterns mailed to the individual monitored him/herself, to allow them to observe their own activities and look for abnormalities or curious patterns. Alternatively, the system could be made to integrate with various other Internet-connected monitoring devices that already exist, such as weight scales, blood sugar meters, blood pressure monitors or pedometers. Activity data could then be aggregated with monitor information into printable or viewable reports, which the caregiver could provide to the elderly person and his/her physician. The data generated by the system could, then, be significantly more medically useful, as it could expose the relationships between activities and health indicators. This would boost perceptions about the product as it would make it more likely for it to be recommended by physicians, and would have value for the elderly persons’ own health, not just caregivers’ peace of mind.

_Tertiary features_

The system must contain several additional features to reduce the risk of its purchase by the buyer – risk which is a barrier to any early adopter, and especially to an elderly individual. First, the system must have powerful network security, to ensure that monitor data cannot be leaked to parties who may use it to find when the senior is not home, or extrapolate private medical information.
Second, the technology provider offer a free trial of the monthly service and a refund policy for the hardware, to reduce economic and functional risk for the buyer and encourage trial.

Finally, quality customer support is required. Given the novelty of the technology, users will have questions and problems that would need to be effectively and expeditiously addressed to avoid harming the brand. Good customer support prevented damage to the Lively brand, as reviewers who experienced difficulties, such as with receiving good cellular reception, nonetheless rated the product as four or five stars because they felt like the issues they experienced were quickly and effectively resolved. Effective customer support may also become a useful tool for collecting customer feedback which can be used to improve future versions of the product.

**Augmented Product**

At an augmented level, the product needs to deliver peace of mind to the caregiver, and a sense of independence to the care recipient. This is to be accomplished by marketing communications, and other considerations described throughout this report.

**MARKETING COMMUNICATIONS**

Broadly speaking, the marketing communications campaign should be focused on educating the consumer about what the product is and what value it brings. The marketing communications campaign must be three-pronged: it must reach the
caregiver, the care recipient, and the key influencer (physician). Communications initiatives to reach each of the groups are outlined below. Creative execution and copywriting is a particularly important aspect of the marketing communications campaign, as any communication perceived as offensive, in particular by the elderly person may mean the product is not purchased: “31% of all people aged over 55 said they had ‘avoided buying products because their advertisements were improperly stereotyping younger or older people’” (Bradley and Longino 2001, p. 19).

**Creative Execution**

*Models*

Creative representations of the decision participants must be consistent with their identities. Accordingly, caregivers should be typically portrayed as middle-aged, with a heavier emphasis on female models who are most likely to be caregivers.

Decisions on models for care recipients are more involved. The model should be consistent with the elderly person’s cognitive age, with how s/he perceives him/herself, rather than with the targeted person’s actual age (75+). Experts recommend having models aged roughly 15 years younger than the intended target, so ~60 year old model should be used (Bradley and Longino 2001, p. 20). Here, too, the emphasis should be on heavier use of female models, as it is women who are more likely to be care recipients in the context.

*Creative Execution*
The primary focus of the marketing communications campaign is consumer education, since the technology is novel and neither of the decision participants understands its value. Accordingly, copy of any advertisements should be information-heavy, and should provide avenues to learn more about the product online (if directed at caregivers) and by mailed brochure that can be requested on the phone, or simply over the phone (if directed at care recipients). At the same time, advertisements should not have the appearance of being related to a medical device or care institution, so as to avoid becoming associated with illness, frailty and old age.

The emphasis of non-informative creative elements is on using symbols and situations to appeal to the intangible benefits of the technology to its active and passive user – peace of mind for the caregiver, and prolonged independence for the care recipient.

It is imperative that all communications, even those intended for the caregiver or care recipient, do not practice “exclusionary marketing” – attracting the young at the expense of the old (Migliaccio 2004/2005, p. 22). This means that portrayals of the elderly should be flattering in all communications. An appeal to the caregiver that suggests or implies that “your mother is now old and it’s time for you to monitor her, especially since you can’t afford institutionalized care and do not want her to move in with you” while possibly relatable to some, is unacceptable, as it portrays the care recipient as frail, dependent and burdensome. Should this communication reach the care recipient, consent for use of the product is unlikely. Accordingly, all communication should be
scrutinized for how it will be received by the elderly, and should avoid references and words that carry connotations of old age and ill health.

Rather, creative elements of advertising, the website or other communications materials should use ambiguous symbols to appeal to the values of caregivers and seniors. The materials can focus on the positivity of the caregiver/receiver relationship, the sense of connectedness they may experience as a result of using the product, as well as the primary values of peace of mind and independence that it creates. To be consistent with the values of the caregiver and receiver, the discussion should be framed in context of promoting peace of mind, independence, and connectedness, rather than addressing health limitations of the elderly.

Overall, the brand image is to be a company that has great respect for the elderly and celebrates their life accomplishments and age transition, and wants to help their loved ones foster a better relationship with them through enabling better care, independent living, and interactions that aren’t focused solely on “nagging” about what has or has not been done. A focus on the elderly’s values in brand image is preferable as they are more influenced by brands and have less practical value to gain from the product (suggesting a need for greater congruence with intangible values). Since the image is positive and emphasizes the rewarding nature of the caregiver/receiver or parent/child relationship, it is likely to be positively received by caregivers, as well.
Communication Elements and Initiatives

As discussed earlier, when faced with the role of caregiving, individuals begin actively searching for information. In today's age, information search is, largely, conducted online. Furthermore, a website is the optimal tool to overcome the primary challenge of the marketing strategy and educate the consumer, as it is a self-paced medium that can support significant volumes of multimedia content. Accordingly, a strong and effective online presence and communication strategy is imperative. Online presence and advertising should be a particular focus, as most or all companies providing the monitoring service are expected to be start up businesses, with limited marketing budgets.

The Website

The website should be the information hub, which would answer all or most of the questions a caregiver might have with respect to the technology. At a minimum, the website must:

- Describe how the technology works
- Communicate the benefit of the technology to the caregiver (peace of mind) and to the care recipient (prolonged independence)
- Describe the specific practical value the system can provide to the caregiver and recipient (e.g. ensuring medication is taken on time, lunch is eaten, etc).

Testimonials and profiles of actual users or, in absence of the latter, profiles of
fictional example personas should be incorporated to ensure the benefits are described not only in generalities, but related to specific uses by identifiable individuals to whom the user can relate.

- Describe all elements of the contract and tertiary features of the product, including all fees and prices, contract policies, refund guarantees and trial periods
- State all data privacy and confidentiality policies
- Demonstrate product installation and answer frequently asked questions about the same
- Offer a telephone number and live chat service to answer additional questions

**Online Advertising**

To assist in information search, the website should be accessible based on common keywords a caregiver may enter when looking for information on their situation, such as “elderly parent living alone,” “elderly care,” “caring for elderly parent,” etc. To gain exposure, the company should engage in paid keyword advertising so its website is accessible based on these keywords.

Social media advertising, and Facebook advertising in particular, will be an especially useful tool as it can help research who are not actively searching for information. …% of the target market uses Facebook. The company may specify that its age be shown to women aged 45 to 54 in their target geography, who have “likes” or social media
content on their pages related to elder care. The ad could then be integrated into their Facebook Newsfeed.

Organic search ranking should further be built up through content marketing. It is recommended that the company begin publishing relevant, quality content on the topic of care for elderly individuals living alone, and promoting this content on its social media pages. Users will appreciate the content, and search engines will increase the website’s rank for keywords related to care for the independent elderly.

The company can also reach out to established online communities and bloggers, informing them of the product and requesting exposure and endorsements. Examples of such blogs/communities are www.stuffseniorsneed.com and www.ageinplacetech.com.

Finally, there is the option of banner advertising on related websites, such as the website of Caregiver Magazine, www.caregiver.com.

**Social Media**

Word of mouth advertising cannot, of course, be controlled, but can be promoted via social media. The user interface should have an integrated function whereby it will ask users to share their experience with the product on their social media channels, as well as through testimonials sent to the company.
Additional creative social media advertising campaigns could be created and executed at relatively low cost. Whereas the company’s blog could be focused on the keyword-rich topic of care for independent elders, social media channels could be used to craft a brand image described in the Creative Execution section.

As an example, the idea of the “remarkable elderly” could be used as a theme for social media presence and content. Company Facebook, Twitter and Instagram pages could focus on sharing pictures, videos and stories (as appropriate) about elderly people who have done amazing things in history or modern day. Such an inspirational, positive message is consistent with what people tend to look for on social media (Bogdanov et al 2014).

The theme could then be used to generate brand awareness campaigns on social media. As an example, a Facebook contest could celebrate the remarkable nature of elderly people around us. Caregivers could be encouraged to share their pictures with their elderly parents together with a brief story about the impact their parent had on them, or a few words about what makes them remarkable, on a company’s Facebook page. Visitors to the page would be asked to vote on their favourite picture/story, and the author of the post with the most votes would receive a Lively system and a year of free service. This would generate positive emotions and a sense of community as a result of the sentimental content being shared, and would increase the company’s exposure, as content authors would reach out to their friends (who are likely to be in similar caregiving situations) to visit the page and solicit votes. On the page, visitors would also learn about the product.
On Instagram, the company could gain exposure by sharing pictures/captions about the “remarkable elderly” consistent with its theme, to ensure they provide value beyond self-promotion, and periodically search for and “like” people’s pictures of or with their elderly family and friends. As people notice the “like” and look into who made it, they would be exposed to the company.

On Twitter, the company could engage in discussion on related topics with leading experts, elderly or caregiver-oriented organizations, and individuals, seeking out relevant topics and hashtags.

**Public relations**

Unpaid media mentions are another source of cost-effective exposure. The company should directly approach media outlets related to aging and care giving (such as Caregiver Magazine) with a press kit that would describe the technology, its benefits, and profile some of its users – the novelty of the technology is likely to be of interest to media outlets and their audiences. Mentions in mass media outlets (CTV, CBC) may be solicited if the company is able to deliver a story that combines a discussion of its technological advances and a “human interest” story of a user, to be featured in segments on consumers, the elderly or technological innovation. Lively, as an example, had been featured in Wall Street, USA Today and Huffington Post, among other outlets.

Similarly, the company should directly approach blogs and publications covering technologies, such as CNet and TechCrunch, requesting reviews and exposure. This
would serve to expose the technology to a readership of early adopters interested in technology advances (some of whom are surely also caregivers), and provide a launch point for features in traditional media.

**Doctors’ Offices**

As discussed earlier, doctors are a particularly influential figure when it comes to the decision to implement and use motion sensor-based monitoring systems. Accordingly, they are another important outlet for communications. To reach caregivers through doctors, it is recommended that the company reach the doctors directly:

- Educate the doctor on the technology and its benefits. This involves publishing articles and white papers on what the system is and what it does. Papers should not be focused on overt promotion of the brand, but discuss primary and secondary research about the technology value. As the user base expands, the user interface should be used to survey users (via a prompt delivered to their dashboard) on topics such as how the technology is used, who it used by, and how useful it has been. This research can be incorporated into information for doctors and used for general purposes of understanding the market.

- Emphasize how valuable the doctor’s recommendation of a monitoring system can be to improving the experience of the care recipient and caregiver. If available, emphasize features related to the physician gaining access to the
care recipient’s data, which can allow for improved care as a result of more accurate activity information.

• Reach doctors by approaching large practices that specialize in elderly care or are located in geographical areas with many elderly residents, in person or by direct mail. The mailing or visit should be geared towards education and raising awareness – providing them with basic information and inviting them to learn more on the website.

• Approach the College of Physicians and Surgeons of Ontario and respective organizations in other jurisdictions with a proposal to run a free CPD (continuing professional development) course on advances in senior care technologies, to raise awareness of the technology (and product) among the profession.

• Advertise in trade journals and publications and speak at conferences related to elder care.

• Provide doctors with comprehensive brochures which they can give to patients they feel may benefit from the technology without spending significant time discussing the product during a visit.

Additionally, upon approaching doctors and with their approval, the company could use doctors’ offices to distribute brochures about its product to patients and their caregivers. Where permitted, the company should install a small model of its system (sensors and power hub) so potential consumers can experience the product directly, alleviating
doubts about its design. The model should be such that the product does not appear obtrusive or intimidating.

Endorsements

Finally, the company should personally approach organizations such as the AARP (American Association of Retired Persons), its Canadian equivalent CARP, as well as the Ontario Caregiver Coalition and its various relevant partners (please visit the Coalition’s website at http://www.ccc-ccan.ca for a full list) with a press kit containing information on the technology and its value. Obtaining features and endorsements from such organizations is valuable to establishing legitimacy, gaining consumer trust and gaining exposure. Such endorsements are evidently possible: the AARP has featured the Lively system in the past.

Elder Consent

Finally, to promote the purchase of the technology, caregivers should be given tools to use to speak to and show to elders in order to obtain their consent to use the technology. This includes:

- Printable brochures which they can give to care recipients and large mail booklets they can order, which will outline the value of the system to the elderly person and answer questions about technology use and risks (see Value Propositions, Product Design above). An emphasis on printed
materials is preferred as elderly better learn information presented in a self-paced way, i.e. by browsing on their own time, with the ability to stop and go back to relevant information (Ensley and Pride 1991).

- Web content (videos and text) serving a similar purpose which they can show the care recipients.
- Information on how caregivers can approach the conversation with their elderly care recipient: instructing them to, for example, avoid framing the conversation in terms of addressing health problems, but rather in terms of promoting independence.

**DISTRIBUTION**

Given the novelty of the technology and the start-up nature of enterprises that develop and sell it, it is unlikely that retail distribution is a viable alternative for businesses given the associated costs. Online selling, however, is both a low cost and an appropriate distribution method for monitoring systems.

Online sales are now an established distribution mechanism. Additionally, online sales combine the distribution channel with the best channel for information provision – the company website. This is key given the necessary emphasis on consumer education that results from the novelty of the technology and lack of consumer awareness about the entire product category. In developing its online storefront, the company must focus
on building trust to overcome consumer concerns with shopping online from a relatively unknown company. This means (Kim et al 2009):

- Improving order fulfillment and reliability, by (1) providing prompt order and shipping notifications, (2) using reliable carriers that offer package tracking, (3) guaranteeing delivery and (4) offering shipping damage insurance.

- Ensuring privacy and security, by (1) collecting the minimum amount of information necessary, (2) developing and displaying privacy and security policies, and (3) using reliable payment methods, such as PayPal, or requiring payment verification through use of CVS codes or credit card SecureCodes.

- Attractive and easily navigable website design, which is (1) constantly updated, “with fast, informative, uncluttered, and easy-to-navigate features,” (2) convenient and minimizes the number of clicks necessary to obtain information or place an order, and (3) helpful, providing product descriptions, reviews, photographs, step-by-step order instructions, and access to order help by telephone or chat.

Given online distribution, the company may distribute its products to a wider geographical region: starting with Canada and the USA, and after expanding to other English-speaking countries, is recommended.

Telephone ordering may complement online distribution.
Should a business eventually have the capability of distributing through offline retailers, it is recommended that this be done through pharmacies or retailers with a pharmacy department (e.g. Wal-mart, Shoppers Drug Mart, Pharma Plus in Canada, CVS and Walgreens in the USA), and placed next to pharmacy counters or in aisles that carry age-related products, such as arthritis medications. These locations are frequented by caregivers who often take care of their elders’ shopping, and are consistent with the quasi-medical nature of the product. The product image is in consistent with the image of electronics retailers which focus primarily on entertainment, and the single product does not justify independent stores.

In the case of retail distribution, point of sale materials need to be included which briefly outline the nature of the product and its value to the caregiver and recipient. The brief communication should be complemented by a QR code which, when scanned, would take the user to a mobile-optimized website detailing additional information about the product. The QR code may be placed directly on the product packaging to avoid paying for in-store display space. If cost is an issue, the QR code may serve as the sole point of communication about the product.

**PRICING**

Price points for a sensor-based monitoring system are difficult to set given the technology’s novelty, which means that virtually no comparison points exist.
Two existing competitors in the space, Lively and Good Robot, offer systems where the hardware is sold for 150USD and CAD, respectively, with a further $19.99 monthly fee for accessing the tracking and alert service without which the hardware is virtually useless.

The arrangement seems reasonable as the arrangement can be justified since the users receive the hardware for the lump sum payment, and access to data, data hosting, and alert services on a monthly basis.

It is difficult to assess the reasonableness of the price, other than to say that Lively reviewers offered no serious complaints about the price, and have, several times, mentioned that the cost is “reasonable,” and to suggest that since the value of the product is largely intangible (peace of mind), the reasonableness of the price is difficult for the consumer to objectively evaluate: the more worried the consumer is about the elder’s well-being, the more reasonable the price will appear. A technology provider looking to set a particular price for its product should use competitive pricing ($150 + $20/month) as a starting point, and undergo an extensive conjoint analysis exercise to arrive at the optimal mix of price and product features.

Two considerations to highlight are that (1) the cost of the system will surely drop as the technology becomes less costly to manufacture, and (2) a technology provider will experience attrition as seniors die or face extreme declines in health. Accordingly, each business should periodically evaluate:
(1) The cost of production, to determine whether the same profit margin can be achieved at a lower price;

(2) The demand elasticity for its particular product – how much additional volume will be sold for a certain decrease in price, and will this volume increase be sufficient to justify the reduction in per unit profitability?

(3) The rate of consumer attrition, to ensure that the cost of attrition can be factored into service prices such that the company does not experience sudden cash flow crunches as customers leave.

PART VII: CONCLUSION

Given the psychological and emotional complexities involved in making elder care decisions, and implementation of monitoring systems in particular, effective marketing will be a key to success of any player in the industry. While technology may be advanced, its implementation is limited by the subjective human experience of potential users.

In parting, the author cautions readers that this report has an expiry date. People change, and as the current elderly are replaced by tech-savvy representatives of Generation X, perceptions of and comfort with technology is sure to change, removing some challenges to adoption of motion sensor monitoring systems, and perhaps, creating others.
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