APS1013 Applying Innovation in Engineering – Final Team Projects, Fall 2012

Development of Business Direction for a Home Monitoring System for Senior Citizens

This project focuses on a local SME, founded by an expert in home automation and robotics, that has developed an in-home system that applies technology to extend human capability. Specifically, our client's company supports seniors who wish to live independently in their homes. As homes become "smarter", they will not only better adapt and accommodate us as we traverse through the conditions of aging, but intelligent home systems will help us stay in touch with family and caregivers too – whether they live just down the block, or on the opposite side of the globe. To support that vision, our client has developed a low cost system that can be used to automate a home or keep family and caregivers in touch. This system sets a new cost/performance benchmark in home automation and monitoring that makes it accessible to virtually anyone – whether you're a senior who wishes to improve home safety through automated lighting at night, or a concerned son or daughter who would like to get an alert if the fridge door or medicine cabinet didn't get opened at the usual time.

Problem Statement

Our client is seeking new and cost effective ways to collect event and activity data from within a home; data that keeps caregivers better informed about the seniors they support. Today, their system obtains simple data on events (e.g. opening/closing a fridge door, switching a light on/off, or stepping on a weigh scale) that helps keep caregivers in touch remotely, but we are seeking innovative ideas for data sources and sensors that can improve the quality of this data while reducing the cost.

Questions to Consider:

- How can we get more specific/detailed information about events within a home? While motion sensor or contact sensors can give approximate ideas of movement or activities within the home, we would like to get more detailed information: Sure the cupboard got opened, but did the can of soup that was taken out ultimately make it onto the kitchen stove? Or, yes, the senior is up and walking about at their usual hour, but is their level of activity frantic, or are their other clues that might indicate they are in distress?
- Cost effectiveness. What other kinds of useful data might we obtain cost effectively from within homes? For example, could we measure emotions via the tones of human speech, detect a cry of distress, identify an event like a fall, or even find an easy way to detect vital signs passively.
- So far we have focused on the ability to share events/activities within a senior's home with caregivers. However, is there any data or information about a caregiver that would be useful for sharing with a senior as well?
- How can we go beyond just sharing of data and actually provide a caregiver with a better sense of "being there", allow them to feel more like they are physically present even though they are not. How can we enhance the realism or experience of data when we are remote?

As our client's product approaches its launch onto the market, a number of processes will have to be put into effect to ensure that value is both delivered to customers and captured by the client. One of the most fundamental aspects of any organization is their customer relationship management system (CRM), and due to the variability and customizability of this product it is particularly important to understand the needs of specific customers. In order to reach this goal, this report proposes the implementation of a customer feedback system. As well, it also includes a detailed analysis of their web portal. Finally, we have included a long term outlook for the business. This includes a look at regulations, permit requirements and potential grants that may be encountered as the product is further developed.

In order to successfully implement a customer feedback system in this industry, an organization must address all forms of customers in order to attain the best possible feedback. Our client's company exists in a three sided market, with relatives (the purchasers of the system), seniors (the users of the systems) and even additional caregivers such as nurses or personal support workers being involved in the use of the product. Following the development of the system, a detailed analysis of survey methods was conducted in order to determine the most appropriate questions to ask during the survey process. Due to the advanced stage of their launch timing and limited funding, a variety of survey methods has been presented. Finally, an implementation timetable has been included based on both date and the number of customers enrolled in the client's program.

Another important aspect of a customer relations model is how a customer interacts with the organization. Although many forms of communication exist between the company and its customers, the most used method will be the web portal system. Although much of the system has already been designed and tested, there is still room for improvement. Through use of Nielson's heuristic principles and the Xerox checklist, the client's web portal has been analyzed and recommendations have made to improve the portal experience for its users.

The final portion of this report is devoted to the long term barriers and possibilities of the organization. Various portions of the product range, such as blood pressure cuffs, fall under federal regulation. In order to ensure government compliance, a number of licenses are recommended. Furthermore many of their operations require specialized permits for installation and maintenance as well as advertising. The specific permits necessary are described in this report. Finally, there are many opportunities to acquire additional funding to assist in product launch and so an analysis of these options has been included.