

Spring 2017

The GOJO Smartlink Observation System: Research for Adoption

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Recommended Citation

Cuenot, Robert; Reich, Austin; Tuck, Joseph; Dick, Sarah; and Poholski, Sean, "The GOJO Smartlink Observation System: Research for Adoption" (2017). *Honors Research Projects*. 571.

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The Hypochondriacs

SMARTLINK Observation System: Research For Adoption

Secondary Research

10 February 2017

Introduction

The scope of the research covered here is to assist GOJO inc. with the adoption of their hand hygiene (HE) and personal protective equipment (PPE) monitoring app known as SMARTLINK Observation System. Research was conducted on government regulations concerning hand hygiene in hospitals, trends in cleanliness compliance, Hospital demographics, GOJO's business model for SMARTLINK Observation System and their competitors, other companies that have successfully integrated app systems into their work, and lastly, who will/will want to adopt this technology into their own business. Our aim here is to provide a clear and researched strategy plan for GOJO to make SMARTLINK Observation System a success.

Government Regulations and Trends on Cleanliness

The first focus point of this research is government regulations and trends in cleanliness. In order for this project to be successful, we need to have an understanding of what the standards are on cleanliness, specifically, hand hygiene.

Hand washing has been a common practice for centuries especially in religious and cultural traditions. Even though it was common for people to wash their hands, many did not realize how important it was to practice handwashing to avoid the spread of diseases. In the mid-1800s, studies by Ignaz Semmelweis and Oliver Wendell Holmes showed that diseases were being spread through hospitals from people's hands. While Semmelweis was serving as a house officer at the University of Vienna

Allgemeine Krankenhaus (General Hospital), he noticed that maternal death rates were much higher in one clinic than another clinic (16% vs. 7%). In the General Hospital, he observed doctors and medical students go straight from performing autopsies to the delivery room with an odor on their hands. This odor was there even after they washed their hands with soap and water. Semmelweis hypothesized that the germs from the dead were being transmitted to the new mothers causing puerperal fever. In order to lower the rate of transmitting puerperal fever and other diseases, he suggested that doctors and medical students scrub their hands in a chlorinated lime solution before treating every patient. Once the hospital followed this suggestion, the mortality rate fell to 3%. Even though the death rate fell at hospitals whose employees washed their hands, it was difficult for Semmelweis to convince his colleagues of the importance of handwashing. (WHO, 2009).

Since Semmelweis's time, knowledge of the importance of handwashing has come a long way. In the 1980s, the first national hand hygiene guidelines were published. In 1995 and 1996, the CDC/Healthcare Infection Control Practices Advisory Committee (HICPAC) in the United States suggested that an antimicrobial soap or a waterless antiseptic agent be used to clean the hands of hospital employees who left the room of a patient with multidrug-resistant pathogens. In 2002, HICPAC guidelines said that alcohol-based hand rubbing would be the new standard of hand hygiene; however, hand washing was appropriate for specific situations. (WHO, 2009).

Despite the guidelines set by HICPAC, hand hygiene is not the highest priority for some people, including individuals working in the healthcare field. According to the CDC, "studies show that some healthcare providers practice hand hygiene less than

half of the times they should. Healthcare providers might need to clean their hands as many as 100 times per 12-hour shift, depending on the number of patients and intensity of care” (Centers for Disease Control, 2002). In hospitals from 1981-1999, it has been observed that the compliance of doctors and nurses to hand hygiene suggestions falls below 50%. In most observations, it has been found that nurses comply more with the regulations than physicians do. (Pittet, 2000). In a study done by the CDC, in a general hospital, 29% of nurses had *S. aureus* (Staph infection) on their hands. Bacterial cultures were performed. These showed that 100% of healthcare workers carried gram-negative bacilli (bacteria that is associated with *E. coli* and salmonella) at least once. It also showed that 64% of healthcare workers carried *S. aureus* at least once. (Centers for Disease Control, 2002). These bacteria can be very dangerous for certain patients such as babies, those who are immunocompromised, patients who underwent surgery, those with open wounds, and the elderly.

Many hospitals have a system set up where an employee watches to make sure nurses, doctors, and hospital staff are washing their hands. This person then records their observations. There are many reasons that hospital employees might not want to comply with the hand hygiene recommendations. A few reasons that the compliance is low include skin irritation by hand hygiene agents, inaccessible hand hygiene supplies, patient needs take priority, wearing of gloves, forgetting, lack of knowledge of the guidelines, and being too busy. (Pittet, 2000).

An alternative to solely washing hands is to wear gloves. According to the CDC, it is recommended that healthcare workers (HCWs) wear gloves for three main reasons. The first reason is to reduce the risk of HCWs getting infections from the patients. The

next reason is to prevent HCW germs from transmitting to the patients. The last reason is to reduce the transmission of germs from one patient to the next patient via a healthcare worker (Centers for Disease Control, 2002). Gloves can be beneficial to both the patient and the hospital worker as long as they are changed regularly.

Many hospitals find it difficult to punish its workers for violating the hand washing guidelines. Nurses and pharmacists work for the hospital which has disciplinary actions for the failure to follow accepted practices. It is more difficult to punish physicians because they are traditionally regarded as individual entrepreneurs. They are rarely disciplined for not washing their hands because hospitals do not want to alienate them and lose the business that the physicians bring in. Since physicians do not face harsh punishment, they tend to ignore the rules. (Wachter, Pronovost, 2009). It would be difficult to enforce hand washing rules if penalties do not exist for the violation. It isn't practical to punish a worker every time they fail to wash their hands because in some situations, the worker does not have time to do so, such as if a patient needs immediate attention. These situations are barriers to handwashing rule enforcement.

Hospital Demographics and Use

In order to market the SMARTLINK Observation System application effectively to hospitals, GOJO must make use of the demographic data in the target market. According to the Society of Hospital Medicine (SHM), in 2013 there were approximately 5,700 hospitals in the United States. Of these, nearly half (49%) contain less than 100 beds. This statistic may seem surprising, but many of these small hospitals exist in rural sections of America. Critical care centers also make up a significant portion of these

facilities. In total, only 5% of hospitals have more than 500 beds (Flansbaum, 2016). Specific data will need to be gathered data about Gojo's fully integrated systems (SMARTLINK) to determine what size of hospitals use that technology. Regardless, it is very unlikely that hospitals with less than 100 beds will be able to afford the fully networked hand dispenser solution. That is where the SMARTLINK Observation System (OBV) application has potential. In their presentation, Gojo suggested that the software cost on average \$3,000/year at \$15/bed. That means that they anticipate hospitals with roughly 200 beds to utilize the app. Using the SHM statistics, there are thousands of hospitals that fit this criteria, which shows potential for the SMARTLINK Observation System to be successful.

Though the potential is there statistically, the other main barrier is the healthcare personnel's willingness to implement new technology. In a study on the adoption of electronic medical records (EMR) by Chihung Lin, I-Chun Lin, and Jinsheng Roan, researchers found that physicians often resisted change regarding medical recording technology. Adoption rates for electronic medical charting remained low through the early 2010s, which may indicate future problems in convincing physicians to use new technology such as the SMARTLINK Observation System (Lin, Lin, & Roan, 2012). One of the main selling points will have to be in the convenience of using the application opposed to other compliance measurement methods.

The SMARTLINK Observation System also has other products and methodologies to compete with aside from phone applications. Technologies such as fluorescent image analysis, microbial sampling, and video monitoring all compete in the same market, but use completely different methods of recording (Deochand, 2016).

Fluorescent Image Analysis allows hospitals to measure the effectiveness of handwashing events, rather than just the fact that the event occurred. This is done by using a special gel with a fluorescent component that binds to the hands during washing. Hands are inspected under UV light to see how much of the component they have on them at random points. Lower fluorescence means a lower quality/infrequent hand wash pattern. A similar method is also used for microbial sampling; instead of using a gel, an actual contaminant such as raw chicken juice is spread on the hands. The nurses wash, and the microbe levels are measured. These methods are both very thorough for measuring the quality of a wash, but not necessarily the frequency. Also, they introduce a break in the normal flow of hospital activity. Video monitoring systems are effective, yet very costly and intrusive. There are privacy concerns related to recording every move a nurse makes, and it can negatively affect morale. One source also notes that the cost of a motion-sensing video monitoring module can be up to \$50,000 per unit (Ward, Schweiser, Polgreen, Gupta, Reisinger, & Perencevich, 2014). Our angle with SMARTLINK is that it is very inexpensive, non-intrusive, and doesn't interrupt regular operating activity of the hospital staff.

Healthcare-associated infections place a burden of roughly \$28-45 billion on the U.S. health system annually, and 1 out of every 20 hospital patients are affected (Marchetti & Rossiter, 2013). The incentive to increase hand hygiene compliance rates is multifaceted, in that hospitals may increase profits and patient health by doing so. With the OBV system's price being so low, hospitals have little incentive to continue using paper and pen methods of compliance tracking versus electronic methods.

Selling Model and Competitive Advantage

One of the main goals of this project is to improve the overall business model to sell the SMARTLINK Observation System app effectively. In order to do this, the value proposition must be justifiable for the customer and the product must remain competitive with other similar products on the market.

The focus on hand hygiene for most hospitals is based on the current government regulations on cleanliness as well as their own particular hygiene compliance needs. If a hospital does not meet these standards, then the hospital will employ a method to increase their overall hygiene compliance. To do this, hospitals are much more likely to try to improve on their current efforts than to reach out to find a brand new method of increasing compliance. This makes it difficult to push for the adoption of a new system and convince a hospital of the benefits of a monitoring system such as the SMARTLINK app. In order to sway hospitals to adopt GOJO's application, the notions of patient satisfaction and overall efficiency should be the main efforts in conveying value to potential hospitals.

One of the major value points of adopting a hand monitoring system such as the SMARTLINK app is that it can show patients that the hospitals care about hand hygiene. To best serve their patients, hospitals need to focus on promoting hand hygiene for the patient's benefit. A hospital's customer is a patient, and just like in any business, the customer must be satisfied with the service being offered to them. According to a survey conducted by SCA, a global hygiene company that focuses on personal care and tissue products, nearly 71% of recent hospital patients are concerned

about acquiring a healthcare associated infection (HAI), and 96% of people surveyed said that they would not want to be treated by a healthcare professional who does not practice good hand hygiene (SCA Survey, 2015). This shows that patients care a lot about the quality of hygiene in hospitals, and this should be taken into account when selling the SMARTLINK Observation System app to potential hospitals. By taking advantage of the tools and analytics provided by the app, hospitals will be able to better improve and communicate their levels of hand hygiene to patients.

Communicating hand hygiene levels to patients may prove to be very beneficial to a hospital's success and satisfaction ratings. With the use of the SMARTLINK Observation System application, hospitals will be able to better analyze their data through the graphs and charts provided in the service. It may benefit a hospital to share this data with its patients in that it could dispel any doubts of that hospital's hand hygiene compliance levels. Showing the extra effort to improve hand hygiene through the use of the SMARTLINK app could help the credibility of many small to medium sized hospitals. Those hospitals with outstanding levels of compliance should be willing to advertise their excellence, and it would help to have actual data and graphs to backup their claims. Getting hospitals excited to share their hand hygiene compliance data is a major value point of the SMARTLINK application, and analyzing the effects of happy patients could prove to be an invaluable selling point to a potential hospital consumer. The SMARTLINK app can help improve the relationship between the hospital and consumer and because of its influence, the GOJO name will be even more connected to the market.

In addition to the ability to better inform patients of compliance levels, the SMARTLINK Observation System application can prove to be extremely useful in making the hand hygiene monitoring process more efficient. Not only does the app remove the need to use pen and paper when recording hand hygiene data, but it provides the hospital with built in data organization tools and charts. Readily available charts and graphs displaying the recorded data can save hospitals time and money, and this is one of the main selling points of the application. According to the results of a 2014 American College of Healthcare Executives' (ACHE) annual survey, the top concern of many hospitals is "financial challenges" (Agwunobi & Osborne, 2016). Creating an opportunity for hospitals to save money should prove to be of great interest to potential app subscribers. In order to be successful in the selling process of the SMARTLINK Observation System app, GOJO must focus on the notions of patient satisfaction and overall efficiency.

It is also very important to compare the SMARTLINK Observation System app to the competition currently available on the market. The three closest competitors in the observations system and analytics market include HandyAudit, mAiriner, and Hygistics. While some features are consistent for most of the apps on the market including price and data entry interfaces, the GOJO SMARTLINK Observation System app has distinct attributes that contribute to its competitive advantage.

GOJO's competitive advantage in the hand hygiene monitoring application space can be broken down into two main factors: preexisting experience being an international hygiene company and the customizable value provided through the SMARTLINK data reports. The major thing that separates GOJO from the other app competitors is the

simple fact that GOJO is a soap and hygiene company. Many of the other hand hygiene monitoring apps are created by software companies that may have no interaction with the hygiene market at all. In fact, HandyAudit, mAiriner, and Hygistics, three of the most prominent products in competition with the SMARTLINK app, are all created by small companies solely devoted to providing hand hygiene recording software. While these companies provide a data collection app/software, GOJO has the advantage because of its ability to offer a data collection application as well as other hygiene products such as soap and Purell. According to a study done in 2007 by Foubert and Gijsbrechts, bundling products together creates a promotion that is far more effective at causing switching than boosting category sales (Foubert & Gijsbrechts, 2007). This means that a company would not want to use a bundling strategy to try to boost sales of a product currently being sold, but if the goal of the company is to acquire new customers by causing them to switch from another product to theirs, bundling may be an effective means in doing this. Bundling may be particularly effective in the GOJO selling model of the SMARTLINK application because it can motivate hospitals to not only switch away from the traditional method of recording hand hygiene compliance with pen and paper, but it may also motivate hospitals to switch to using GOJO soap products. This could create extra value in the SMARTLINK application in that it can act as a stepping stone product and eventually develop a long-term bond between GOJO and the customer. According to Yongmin Chen in his article regarding equilibrium product bundling, he states that bundling allows for the use of a company's monopoly power in one market to be leveraged to "foreclose sales in, and thereby monopolize, a second market." He also says that bundling allows firms to differentiate their products, which leads to a reduction

in price competition in the firm's primary market (Chen, 1997). According to Foubert, Gijsbrechts, and Chen, bundling the SMARTLINK application with GOJO's soap products may lead to increased soap sales as well as lessened competition in the soap market because of the differentiation that the bundling offer creates for potential GOJO customers.

GOJO has to leverage its expertise and knowledge of the hand hygiene market with the SMARTLINK app, and this really shows in how the application functions. Within the SMARTLINK app, it is possible to record hand hygiene and personal protective equipment observations independently, which is not possible in some competitor apps. There is also a great deal of customization that allows users to record observation data in a way that is most useful to that specific hospital. This creates exceptional value in the reports and charts that can be automatically created with the collected data. This is an area where GOJO has an edge over its competitors because of the utility it provides healthcare employees who use the data. These employees use hand hygiene compliance data to make big decisions; current compliance levels are often driving factors in hospitals' decisions on cleanliness. If a hospital is experiencing a low compliance level then they may decide to increase hand hygiene efforts, but without the data collected through observation hospitals have much less insight on their state of hygiene compliance. Instead of having to manually input the data into Excel and create the charts and graphs needed to evaluate compliance, the SMARTLINK app has the ability to formulate these graphics automatically. This can save users a lot of time and effort and in turn lead to easier decision-making when it comes to hand hygiene compliance.

Other Successful Start-up Apps

With mobile applications being one of the fastest-growing segments of downloadable software applications markets (Lee and Raghu, 2014), it is important to look at other successful apps in order to learn from their success. A case study was done on a hand hygiene monitoring app developed and implemented by Vanderbilt University Medical Center that was almost identical to the SMARTLINK Observation app. In 2009 before the app was used, hand hygiene compliance was at an estimated 50% due to not having an adequate or frequently used system to record hand washes or other forms of sterilization. Staff also were not being held accountable for proper hand hygiene or recording of it (Morrissey, 2014). Actions were taken to boost the 50% compliance including education on hand hygiene and its importance and addition of hand sanitizing stations inside and outside of every room (Kalb, 2014). A strict (pen and paper) recording system was also implemented. With this system, accountability measures were also put into place. Every unit had an observer at management level. Before this new system, there had been a total of 3,000 observations from the past seven years. With the system in place, observations were coming in at a rate of 3,000 - 4,000 a week (Morrissey, 2014).

Incentives such as rebates on malpractice insurance added to annual budget were offered if the entire facility met certain compliance goals. Each individual unit's scores were able to be seen by all staff which helped create peer pressure for all units to perform well (Kalb, 2014). This system worked well and brought the hand hygiene

compliance level up to 80% by 2012. Although this system made drastic improvements in hand hygiene compliance, it was still not perfect. Observer fatigue was happening frequently concerning accurate observations and constantly transferring all the data from written record to a computer database. Because observers were needed in every unit and for all shifts, another employee (upper management) was needed to keep track of them all and make sure there was an observer in every unit at all times. These bumps in an otherwise smooth system made Vanderbilt University Medical Center develop an app almost identical to the SMARTLINK Observation app (Morrissey, 2014).

The Vanderbilt University Medical Center's app allowed observers to record everything from their paper system (what unit, what kind of health professional, if they washed or sterilized their hands, etc), but also uploaded this data to databases that generated charts, graphs, and reports for the hospital. The app also told observers where they were assigned reducing the need for upper management to oversee them. The implementation of this technology and ease of recording brought the compliance rate from 80% in 2012 to 95% in 2014 (Morrissey, 2014).

Apps such as the SMARTLINK Observation app have been proven to work, but how do hospitals find them? Aside from direct sales from the company or developer, presence on the app web store (name dependant on your operating system) is how hospitals and users determine what app to download and subscribe to. Apps with the best presence (top 300) on their respected web stores shared the qualities of broad offerings over multiple categories, a free initial download, frequent updates for quality, and user reviews (Lee and Raghu, 2014). While the SMARTLINK Observation app

cannot offer such things as broad offerings over multiple categories, they can focus on aspects such as consumer reviews, otherwise known as electronic word of mouth (eWOM). Consumers are much more likely to download an app with good reviews. It shows validation from other users and creates trust. The two things that create appealing reviews are confirmation of the product quality, but more importantly, confirmation of service quality. Consumers want to know that your app will function incredibly well, and that so will the customer service when the app fails to do so (Liang, Li, Yang & Wang, 2015).

Who Wants to Adopt This Technology?

Hand hygiene is perhaps the most important factor in decreasing the transfer of nosocomial infections. It is of paramount importance for healthcare workers to wash their hands not only as a way of keeping patients safe, but also as a way of keeping hospitals safe from lawsuits as a result of negligence. In 1991, the Supreme Court of Pennsylvania said, "Corporate negligence is a doctrine under which the hospital is liable if it fails to uphold the proper standard of care owed to the patient, to ensure the patient's safety and well-being while at the hospital" (Annas, 2006). Given this, it would seem obvious that ensuring that healthcare workers are taking every measure to ensure that they are doing their jobs well would be not only a moral but also legal obligation of a hospital. As the New England Journal of Medicine points out, "Nosocomial infections resulting from a hospital's failure to adopt or enforce hand-washing policies would be even easier to demonstrate as a breach of a hospital's duty to keep patients safe." The

implementation of new technologies that make hand hygiene recording more reliable and efficient should be a welcome sign for any healthcare provider (Annas, 2006)

Some hospitals have gone to such extreme measures to ensure workers are washing their hands as to install cameras in rooms and have workers as far away as India watching images to ensure they are following protocol (Hartocollis, 2013). The Center for Disease Control Prevention estimates that intra-hospital infections cost upwards of \$30 billion and the death of almost 100,000 patients per year. Financial incentives such as losing out on Medicare funding for the spread of preventable infections is one fiscal repercussion if the loss of reputation and human life in a highly competitive industry wasn't enough of a deterrent for lax hand hygiene protocol (Hartocollis, 2013).

With the advent of mobile technology, corporations and workers have been able to integrate their former methods into a more connected electronic model. This shift has been heavily observed in the last several years with companies beginning to see the advantages of new pieces of technology such as the internet of things (IoT), cloud computing, and mobile devices. Hospitals are not sheltered from this wave and many are beginning to take advantage of cost cutting measures and ways to decrease errors while enabling an increase in the flow of information.

A large part of this initial wave was set in motion in 2004 by President George W. Bush, and finally enacted in 2009 when President Barack Obama signed The Health Information Technology for Economic and Clinical Health Act (HITECH Act). The primary goal of the HITECH ACT was to promote faster adoption of electronic health records and other IT healthcare related technology. Hospitals were presented with a

financial incentive to change over to an electronic format before fines would begin to be imposed starting in 2015. This was a major factor that saw hospitals shift towards using the IoT as a replacement for older manual procedures. While legally mandated through financial incentives, HITECH has been a catalyst for new IT systems to be implemented in Hospitals with the specific goals of cutting costs while promoting better more effective care for patients. Initiatives such as the HITECH Act have made the implementation of IoT services such as GOJO's SMARTLINK Observation System more viable and more likely to be adopted due to previous experience and success in the area. (Nelson & Stagers, 2016)

Not only has there been legal and political incentives to adopt new IT technology in the healthcare field, but economics have finally made it practical to implement much of the technology offered by the IoT. Implementation of the cloud and IoT specifically has been rapid and is expected to increase at a staggering rate over the next few years. Estimates peg the spending on cloud computing for hospitals to triple by 2020 to \$9.5 billion. Growth will be fueled by lower costs, improved efficiency, and changes in regulations that will make cloud computing and the adoption of such technology more economically feasible. While the growth of the industry seems poised for expansion, it will most likely be slightly curbed by ever increasing security concerns (McCarthy, 2015)

In a recent poll conducted by Gallup, 57% of respondents claimed that a hospital's history of medical errors had "a great deal of influence" when choosing whether to use services provided by that hospital (Bizzard, 2005). Researchers in Taiwan conducted a study to see whether or not cloud computing used in hospitals had an effect on the perceived level of quality and trust between hospitals and cloud service

providers. The conclusion of the study found that the better quality of service and information provided as a result of a cloud service was related to an increased level of trust (Lian, 2017). As a result, this higher level of trust can be passed onto the patients through the advertising of more sophisticated and reliable ways to ensure compliance with hand hygiene protocol. The use of GOJO's SMARTLINK Observation System could be used as a marketing tool to promote better safety standards and more accountability to increase the trust of patients that they won't contract an avoidable infection as a result hand washing.

While cloud computing will bring advantages that seem more straightforward for industries, it may also be a catalyst for other practices within the industry. Data analysis is nothing new, but the possibilities that seem within grasp as a result of a more interconnected tech infrastructure can be game changing in the way the analysis is conducted and patients are protected. As technology continues to accelerate and become cheaper it can only be expected that the vast majority of hospitals will begin transitioning from manually entering most of their data towards using cloud based services. With the impending building of infrastructure for the 5G revolution, many hospitals would be wise to make the shift to an IoT platform as a way to cut costs, become more efficient, and ensure the best possible care for their patients

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The Hypochondriacs

SMARTLINK Observation System: Research For Adoption

Primary Research

27 April 2017

Introduction

The purpose of this project report is to explain our group's research methods and findings to help improve the GOJO SMARTLINK hand hygiene monitoring application.

The SMARTLINK observation system app is a hand hygiene monitoring tool used to help increase hand washing compliance levels in hospitals. With its built-in feature that allows for immediate data reporting through graphics and charts, the application is able to provide a certain value proposition in creating a higher efficiency model for hospitals to collect hand hygiene data. The main problem hindering the success of the app is the selling model and speed at which the application is being adopted by hospitals.

Because of this, GOJO has asked us to research the market and find ways to improve the current model of the SMARTLINK observation system. The specific overall project goals given to us by the GOJO team included looking at customer pain-points, additions that could be made, how to improve the promotion/selling model, and even the idea of new market activation approaches.

With the project goals in mind, our group created a project research plan to learn more about the market and product through secondary research and also to gather information on specific hospital needs and barriers to sales. Our first major research objective was to learn more about the background on hand hygiene. The majority of this step was conducted through our secondary research, and was described through the history and legislation surrounding hand hygiene. Next we wanted to understand the application and hygiene monitoring market. We mainly looked at the competitors in the space as well as what it means to operate in this market. This step in our research plan

provided us with the information needed to make valuable conclusions and recommendations pertaining to the sales model. After looking at the application market, we were able to get into one of the main aspects of our primary research which involved gathering information on hospital needs. This was done through surveying five area hospitals as well as conducting phone interviews with two hospitals that are current SMARTLINK users. In order to create a valuable survey we chose to focus on the overall project goals and from there we were able to brainstorm possible survey questions. At the end of the process we created a seven question survey that we were able to use to find out about hospitals' current methods, the personnel recording the data, the reason and usage of the collected data, and also the pain-points of the current system in place. After that we further researched alternative markets and barriers to sales with the help of Dave Payne, the Director of the Fisher Institute of Professional Selling at The University of Akron. With his insight and expertise in medical sales, we were able to form many of our conclusions regarding the sales model of the SMARTLINK application.

Throughout the remainder of this project report we will discuss our primary research methods in further detail. This will include our findings through our primary research as well as our final conclusions derived from that research. Then finally, based on our conclusions, we will provide four comprehensive recommendations for GOJO to improve the SMARTLINK Observation System Application.

Surveys

For the first substantial piece of primary research, we conducted surveys that targeted nurses at five local hospitals to serve as a barometer for perceptions within the industry towards hand hygiene. Through our contacts we were able to receive input from Akron City Hospital, Barberton Hospital, Akron Children's Hospital, Mercy Hospital, and University Hospital. We felt that finding more information about current methods from hospitals that were not using GOJO SMARTLINK technology was vital to better understanding how to improve GOJO's product. The survey questions focused primarily on the current methods of monitoring as well as some hypothetical and more subjective based questions to get a feel for how the nurses themselves would improve the system.

The questions that we used are as follows:

1. How is hand hygiene currently monitored and recorded?
2. Who is responsible for recording data, and how often does the recording process take place?
3. How is the data used and how is it entered into your system?
4. What are some of the pain-points in the data collection and entering process?
5. Are you/hospital management satisfied with current hand hygiene compliance levels?
6. How would you improve the process? Do you think the adoption of new software to increase efficiency would be an option?
7. Do you currently use any GOJO products in your hospital?

Through these surveys we were able to piece together some recurring themes and integrate it into our recommendations to improve SMARTLINK.

For the most part all of the hospitals included in the survey had their own way of monitoring and recording their hand hygiene compliance data. Some would have supervisors administer a monthly audit or have a special set group of trained nurses

record and then upload the data. It was homogenized for the most part in the sense that the nurses were usually selected at random and ordered to observe other nurses as they went through their daily routines. All but Akron City Hospital initially recorded the data using pen and paper through direct observation, but they all did enter the data into software for further analysis whether it was through Excel or another more specific monitoring program.

For the most part the data was used as a way to make sure that compliance levels were meeting regulations and benchmarks put forth by the hospital. Quality improvement is a major reason for hospitals taking and monitoring this data in hopes of cutting back on the spread of intra-hospital diseases. In some cases if levels are not where they need to be per the hospital's standards, there is further education in the department that there is a problem. It is their hope that through reeducation compliance levels will increase.

There was concern among the respondents in the sense that they feared many of the surveys would carry a bias and that it wasn't anonymous for the nurses to be observing each other in the open. Many nurses felt as though there was some bias because nurses evaluate other nurses which may lead to more favorable numbers. They feel that peers evaluating peers can lead to giving them favorable marks and inflating compliance levels thus not giving an accurate measurement. There was also some concern that the Hawthorne effect would take effect and as nurses were watching them and it would lead to unnaturally high numbers due to paranoia from the observed nurses.

There also appeared to be a differing in thoughts among demographics in regards to how technology should be adopted which led us to believe that there needs to be a different approach to the selling method in regards to age. The younger nurse was more apt to adopt the technology and felt that it would increase efficiency while the older nurses were more wary about changing. They felt that the pen and paper method was sufficient and switching over to software or training required will decrease the amount of time that they can spend with patients and it won't have a material effect on compliance levels. While observing at City Hospital there was a software shift that was causing consternation among some of the older nurses which led us to believe that perhaps shifting demographics will help improve sales numbers in the future, but a proactive approach should be taken in the short run.

Phone Surveys

In conjunction with the local hospital surveys, we also conducted phone surveys with health care compliance directors from two hospitals that currently use the SMARTLINK OBV application: Dartmouth-Hitchcock and The University of California Irvine hospitals. We began by asking them many of the same questions that were found on the survey for the local hospitals. Their responses varied slightly, but overall carried the same sentiments as previous hospitals we had interviewed. Both hospitals felt that their compliance levels were "okay", but had significant room for improvement. Beyond the standard questions, we also had another set specifically relating to SMARTLINK:

1. Do you feel like the App has been worth it on a cost basis?

2. Have there been any problems with the adoption of the technology with older nurses/ problems with people learning how to use the technology?
3. Has handwashing compliance increased as a result?
4. Do you feel that all the information is necessary and useful (graphs, charts, etc...?)
5. Do you have any suggestions about the app itself?

The goal with these questions to gain insight as to how the app is actually used in the real world. The University of California Irvine uses the app exclusively for monitoring hygiene across all 40 of its locations. At the main location, they have 2 teams that travel from floor to floor with the app on iPads. These workers are specifically trained to use it, and can minimize bias in reporting because they are not monitoring employees that they directly work with. They especially like the tagging feature of the app, but wish that they had more customization options in reporting. Dartmouth-Hitchcock by contrast uses 3 different systems for monitoring hygiene: the SMARTLINK app, customer satisfaction surveys, and EcoLabs' fully automated monitoring system. They feel that using a combination of automated and manual observation systems gives them the most accurate representation of their compliance level, due to the fact that the automated systems tend to be harsh in their reporting and manual observations are more lenient. They use a more reactive than proactive approach to compliance, so the app is mainly used when a floor/team/person is not meeting standards. They would like to monitor more frequently, but the process often falls down the list of priorities.

Sales Research

In order to gather a better understanding of how SMARTLINK Observation System is being sold, we met with the SMARTLINK team at the GOJO headquarters to discuss the sales process. We were told that all GOJO products are presented and pitched simultaneously to hospitals in an hour long sales meeting by GOJO's Healthcare Sales Directors (HSDs). Because of the nature of this type of sales call, the HSDs focus the majority of their time selling hospitals on soap, hand sanitizer, and the SMARTLINK fully automated hand hygiene monitoring system due to the higher revenue generation for GOJO and the larger commissions for them. Many times, the SMARTLINK Observation System never gets pitched at all and is skipped over in the presentation. On top of that, users must sign up for the app's subscription based service through GOJO directly in order for customization for that specific hospital. There is no in app registration and payment option.

We then took this information and met with professor Dave Payne, head of the Fisher Institute of Professional Selling at The University of Akron. Dave has had 30 plus years working in sales, many of which in medical sales, and currently teaches sales techniques privately as well as for The University of Akron. We discussed with him the product, the sales system GOJO currently has in place, and the problems they are facing with the current system. From this meeting, it became clear that the current sales model was ineffective for selling the SMARTLINK Observation System. It was not being pitched, hospitals were not getting the information necessary to establish its value and when presented, it was shown as an alternative for GOJO's fully automated hand hygiene monitoring system, not an add-on. Furthermore, minor adjustments to that model were not going to fix that problem. The general consensus was that

SMARTLINK Observation System simply generates too little revenue and commission for the HSDs to really push it. The commission on a system that costs only several thousand dollars annually could never be enough to convince HSDs to really work hard at selling it. It also was viewed as having the ability to keep them from the sale of the fully automated SMARTLINK system and take time away from them pitching other products. That paired with the inability to register and pay via the app alone keeps exposure to the system incredibly low. Low exposure does not generate sales for any product. A new sales strategy or positioning of SMARTLINK Observation System must happen.

It should also be noted that there is currently no hand hygiene compliance rating standard that hospitals and healthcare facilities must meet. This means that even if GOJO was able to get the information for SMARTLINK Observation System in front of all hospitals, the incentive to buy would purely be on a case by case basis and what hand hygiene compliance rating that hospital found acceptable.

Conclusions from Research

Based off of our research, we have concluded that the current sales strategy is ineffective, some hospitals prefer having both automated and manual observations, hospitals need incentive to increase hand hygiene levels, users of the application found it to be intuitive and that education is vital to improving compliance levels. The following are our recommendations to GOJO from these conclusions.

Recommendations

Recommendation 1: Improve Features

Throughout our process of talking and visiting with hospitals we came up with a few recommendations that Gojo could use in order to improve the Smartlink Observation System Application. One of the recommendations that we came up with is for Gojo to improve the features of its app. We first started our research by talking to a few hospitals who already use the app.

The hospitals we talked to that were already using the app liked the app overall. They suggested that the app would be better if it had better features and was more customizable. The hospitals found that the app was lacking a few reporting tools to a certain degree. They would have liked to be able to be more specific in their reports and be able to customize the graphs more. Hospitals also wanted the graphs to have more colors and different graph styles such as a pie chart or line graph. Another area that was lacking a little bit was the PDF export function. Hospitals mentioned having improvements done to the app to improve the PDF export utility for reports. From some of these suggestions, we were able to gather our own conclusions and come up with a few improvements that Gojo could do to improve the app and make it more appealing to new customers.

We think that making the sign-up process easier would draw in more hospitals to use the app. Currently, it is easy to download the app on the app store, but you can only

do so much with the demo version. If you want to experience the full version of the app, you have to call Gojo so they can set up the app and customize it for your hospital. Now we understand why it is important for Gojo to set up the app for each individual hospital and make it specific to the hospital, but we think it would be a good idea to make this process easier. For the bigger hospitals, it is important to customize the app so that it is specific to the number of beds and areas in the hospital. For smaller hospitals with less than 100 beds, it would be much easier for the customer to set everything up themselves. There could be a set-up function in the app when you first purchase it that allows hospitals to select the number of beds and sections in the hospital. This type of setup would make it easier for a hospital to see the app on the app store, use the demo, and then decide to purchase and customize the app all in one day without having to go through the middle man.

Another beneficial way to improve the app is to allow the demos to be able to have some sort of reporting features. A few options for the reporting feature is to allow the hospital to put in data and from there be able to create graphs for reporting. The graphs could have a watermark on them so that it would be difficult for hospitals to use the reports in the free version. We also suggest that if Gojo doesn't want to use the watermark to protect their reporting features, they could have set data that can make up the graphs. This would show the hospitals who are using the demo what the reporting would look like. Even with set data for the reporting, hospitals can still play around with the demo and enter in their own numbers. This improvement would greatly benefit both hospitals and Gojo. It would benefit hospitals because they can adopt the "try it before you buy it" mindset. This would greatly increase the number of hospitals who would

want to officially buy the app from Gojo. Gojo would then make more money from having so many new customers.

Recommendation 2: GOJO Gold Star Approval Rating

To combat the previously noted issue of lack of hand hygiene compliance standards, we recommend GOJO creates an approval rating/award given to hospitals and healthcare facilities that match a certain compliance percentage set by GOJO. The benefits of this are fivefold: Improve hand hygiene compliance across the board, associate GOJO with the the highest levels of hand hygiene, create incentive to have a hand hygiene monitoring app even if you do not want a fully automated system, increase sales of other GOJO products such as soap and sanitizer and lastly act as advertising for GOJO.

Creating a GOJO gold star approval rating gives GOJO the opportunity to set the bar for hand hygiene compliance and allows hospitals to show off that they meet that standard. Because of this, hospitals will have an incentive to increase their hand hygiene compliance so they can be awarded GOJO's approval rating. This then gets other hospitals on board in order to maintain the same level of service and patient trust as other competing hospitals, increasing hand hygiene compliance across the board. Along with increasing hand hygiene compliance, it also associates GOJO's name with the highest level of hand hygiene which can then help insure trust when patients walk into hospitals and see GOJO products features and the approval rating displayed. Since patient feedback and opinions are crucial to hospitals, those that do not already have

high hand hygiene compliance will associate GOJO with high compliance as well and seek out GOJO monitoring systems to help raise their compliance rating. This can also help penetrate SMARTLINK Observation System into smaller hospitals that cannot afford a fully automated monitoring system, but still feel the need to put systems in place to boost their hand hygiene compliance rates to the GOJO Gold Star Approval. This industry wide increase in hand hygiene compliance would mean that more hospital staff are washing or sanitizing their hands, translating to a larger demand for GOJO soap and sanitizer and a larger amount of sales in those products. The SMARTLINK observation app itself may not generate a large amount of revenue, but can be used to increase revenue coming in from soap and sanitizer sales. Lastly, creating a GOJO Gold Star Approval rating works as advertising for GOJO by having the GOJO name out there more so than it already is creating brand recognition and trust.

GOJO already helps sponsor medical conferences such as the annual National Association of Healthcare Quality (NAHQ) conference. These conferences are the ideal place to present hospitals with the GOJO Gold Star Approval. Hundreds of healthcare professionals attend these conferences and would be exposed to the approval rating, making them want it for their own healthcare facility.

Recommendation 3: Bundling and Modified Sales Model

Our third recommendation is to completely change the current sales model. As it stands, the salespeople at Gojo have zero incentive to sell the application over one of the fully automated systems. The app brings in very little revenue, which means its

commission is low. If Gojo wants to get the application in the hands of users, we recommend that they drastically alter the sales offering and model. One way to do this would be to bundle the application with sale of different products, such as soap or the automated system itself. The real value of the application lies not within the yearly revenue it brings, but rather within its marketing ability and potential for boosting soap sales. The more people that use the app, the more brand recognition Gojo gets. If non-Gojo customers are able to sign up for and use the app easily, they could possibly be converted into customers through some method in the app. Also, as compliance levels increase, hospitals will inherently go through soap faster and faster. These advantages are difficult to quantify, but could ultimately result in more revenue generation than the app subscription currently brings in. The primary goal should be to make the app as ubiquitous as possible throughout the market, and then worry about at path to monetization in the future.

The delayed monetization/freemium model is something fairly common in application markets. One of the first companies to take advantage of this model was RARLab with the WinRAR application. WinRAR achieved relative ubiquity amongst PC enthusiasts as an intuitive file compression program in the late 1990s and early 2000s. The application had a 40 day free trial, but would not stop users from using the program if the trial expired. As a result, people continued to use the program far past the 40 days, integrated it into their daily workflows, and found that it could be a useful tool in the workplace as well. Ethical businesses purchase their software, which is where the majority of RARLab's revenue comes from. The relaxed trial limits helped WinRAR gain an edge as one of the most-used file compression programs for Windows systems.

Mobile application markets have adopted a similar model, however on a much larger scale. The vast majority of applications on both the iOS and Android marketplaces utilize freemium model, in which the application can be downloaded for free but offer in-app purchases or advertisements to gain revenue. Users never have to pay for anything unless they want exclusive features or to disable ads. Games tend to favor the in-app purchases, while other utility applications display the ads. Developers understand the draw of the network effect, which is why they choose to offer the app for free. These apps require large userbases to draw significant revenue though, something which the OBV app will never be able to achieve due to its niche market. There are only so many places where the app can be used, and it is not reasonable to think that millions of users will be downloading it. There is something to be learned from this though: users favor apps that they can quickly install with zero upfront cost.

GOJO can use this to its advantage. If they allow hospitals to easily download and test the SMARTLINK OBV application for as long as they please, GOJO could penetrate into more hospitals and likely improve the trial-to-subscription conversion rate. We are not suggesting just giving the application away, but rather allowing hospitals to use it and pay for it without so much restriction. As we mentioned in the first recommendation, there is no easy way to get a working version of the application without first contacting a GOJO representative, which is a major barrier to adoption. Improving this would get the app into more users' hands and hopefully lead to more revenue.

Recommendation 4: Expand Into New Markets

Our fourth and final recommendation is to expand the reach of the SMARTLINK application into new markets. The current model of the app is focused mainly on the healthcare industry and monitoring hand washing and glove usage. In some ways the app is even used as a segway tool for GOJO to reach out and sell other products such as soap. This makes sense because GOJO does a lot of its business within hospitals and healthcare facilities, but we do believe that there is room for a hygiene monitoring application like the SMARTLINK observation system in other markets.

Some of these new markets might include schools, daycares, restaurants, culinary programs, chemical labs, and even factories. Each of these businesses has a need for hygiene compliance, and we believe that having a hand hygiene monitoring tool available would be of major use to employers in these businesses. Being able to track employee hygiene habits and ensure proper hygiene practices could really help improve compliance across the business. Especially for markets like chemical labs and factories, employers often require all employees to follow hygiene guidelines because improper compliance habits could lead to safety hazards and injuries. The higher the need for compliance, the higher the likelihood for that business to have a need for a hygiene monitoring application system.

In order for GOJO to move into some of these new markets, it will be necessary to make changes to the current SMARTLINK application. New customization options or perhaps even a separate application that caters to these markets will ensure the application's usability for many different hygiene options. For example, there may be additional customization options to monitor helmet, earplug, or even hair net usage depending on the business hygiene monitoring needs. A monitoring application that is

able to record and report data like the SMARTLINK app can prove to be very useful in a lot of situations that are not being capitalized on currently.

Moving into these new markets can help subscription sales of the SMARTLINK monitoring application, but also may be able to increase sales of other GOJO products. Like mentioned in our third recommendation, bundling the SMARTLINK app with other GOJO products such as soap can be a very good way to create exposure. In these new markets the addition of discounted soap or even lower costs of subscriptions for bundling might prove to be a major incentive for businesses to invest in GOJO products. Whether it is a daycare looking to purchase Purell or even a restaurant in need of a new soap product, GOJO can use the SMARTLINK hygiene monitoring app as a stepping stone to reach out into these new markets to sell these high margin products in all new environments. After the SMARTLINK application reaches a higher level of success, this idea of expanding into new markets could be a very beneficial opportunity for GOJO in the future.