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Studying Process Flow at the Foster Hospital for Small Animals

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STUDYING PROCESS FLOW
AT THE FOSTER HOSPITAL FOR SMALL ANIMALS

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Abstract

The goal of our project was to enhance customer service by focusing on the phone answering service and the process flow at the Foster Hospital for Small Animals at the Tufts Cummings School of Veterinary Medicine. Our phone design created separate phone trees for each hospital division. Our process observations demonstrated opportunities for improving check out and exam room use. Enhancing the customer experience from the time patients call to the moment they exit the facility will boost customer satisfaction.

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1. Introduction

The Foster Hospital for Small Animals at the Tufts Cummings School of Veterinary Medicine handles over 26,000 small animal cases per year. They are currently planning a zoological companion animal service and expanding their facilities. The Foster Hospital for Small Animals (FHSA) is focused on providing excellent customer service, and our project involved two objectives, redesigning of the phone answering service and analyzing flow information, which will be very useful. We used the DMAIC process to effectively to decipher and suggest improvements for potential issues. The DMAIC is an approved, effective process because it allowed the project team to systematically break down the task, analyze it, make improvements, and then to make recommendation for implementing our improvements.

Handling customer phone calls effectively is very important to a hospital, and erasing confusion and unnecessary procedures gives a hospital advantages within its process flow. FHSA wants to clear their phone answering system of all confusing, stressful and unneeded procedures for the clients, making it easier for them to call and be able to contact who they are looking for quickly and easy. The hospital receives some callers who end up in the wrong department because of confusion from the phone menu. Pet owners have become restless while waiting for long menus to be read or they simply get lost and just press 0 to receive an operator, not necessarily in the department they are looking for. These phone issues cause longer than desired phone wait times, employees spending more time trying to get the client to the right department, and time taken away
from incoming patients. Improving the answering system will make the FHSA a better service provider for their clients.

Improving customer service is important and not only deals with telephone interactions but also the layout of the facility. Creating a more accessible facility is the goal; this will provide timelier visits to the Veterinary Clinic for patients. During these visits we analyzed the front desk, exam rooms, and waiting rooms in efforts to track the time spent at each phase of the visit. Timing the procedures within the process flow gave us insight into how the process works. From when a client enters the visiting room to when they check out and are getting their animal prescriptions from the pharmacy, we wanted to improve the customer’s experience by reducing unnecessary and unwanted wait times.

**Summary**

| The goals of our project are to enhance customer service at FHSA by focusing on their phone answering service and the process flow. Our first objective was improving the answering service. Our second objective was focused on the customer’s experience when making a visit to FHSA. Enhancing the customer experience from the time a patient calls with a problem to the moment they are receiving their prescriptions after the visit will boost customer satisfaction, resulting in marketing of the service through customer recommendation. |
2. Background

The Foster Hospital for Small Animals at Tufts University Cummings School of Veterinary Medicine is a prominent veterinary clinic; one of the finest in New England. It was founded in 1978, and is located in Grafton, MA. It is known for its programs that supports compassionate healthcare for animals, top-level research, and conservation (FHSA, 2011).

2.1 Veterinary Clinic

The Foster Hospital for Small Animals at Tufts University Cummings School of Veterinary Medicine has doctors who have the ability to diagnose and treat even the most difficult and complex conditions. The medical complex consists of two hospitals, which are called the Foster Hospital for Small Animals and the Hospital for Large Animals. The facility consists of over 40,000 square feet of hospital space (Tufts, 2011B). Both hospitals provide customers with 24-hour care for animals. The large animal hospital is New England’s premier facility to care for horses, alpaca, llamas, goats, pigs, sheep and other large animals. To handle large animals, (such as horses, goats, llamas, etc.) a large amount of space is needed (Tufts, 2011B). The problem is that the small animal hospital handles over 26,000 cases, primarily cats and dogs a year (Tufts 2011A). With faculty specialists in every field of animal medicine and the region's most powerful diagnostic imaging capabilities (Tufts, 2011A), the small animal hospital has a significant customer demand due to their prestigious reputation. They also tend to hamsters, rabbits, and other small mammals. They also tend to zoological companion pets, so they have specialist to deal with snakes, iguanas, fish, bird, etc. (Tufts, 2011). As their zoological companion
animal service develops, they will need more space for the specialists to work with the exotic animals.

### 2.2 Process Flow Issues

The restriction of space in the clinic has a large impact on the flow of patients being treated, and also on the waiting times. Space is a constraint in working with the customers because they sometimes do not have enough space to treat the high volume of animals, which includes emergencies and scheduled appointments. This causes customers to wait a longer period of time in the waiting rooms before their animals can be seen by the doctors. Certain animals are afraid of other animals which causes a bit of tension for the animal and discomfort for both that animal and its owner. Along with the waiting room issues there is an issue with the checking in and out processes. Due to the high volume of customers the line at the front desk becomes a bottleneck.

### 2.3 Layout/Facility

The floor plan contributes to the time issue in the hospital. Important rooms are located in different areas of the building. The pharmacy is located in the back of the small hospital, which makes it impossible for a pharmacist to interact with the pet’s owner. Medications are delivered through a chute that leads to the main desk, and the employees at the main desk handle and distribute the medicine. The employees at the front desk do not have expertise in pharmaceuticals, so there is some room for error, for
example an owner might get the wrong medicine. Also it can cause delays in checkout time because the customer is waiting for medications.

There are a limited amount of rooms available and certain rooms are reserved for emergencies. If an extra room is needed it can’t be used if it is reserved for an emergency regardless of whether there was emergency. This causes longer wait times, because the doctors have to wait for a room to clear up before they can begin their examination. It also causes the animals to get anxious and act uncharacteristic.

Finally, in the hallways there are boxes and bags of goods that should be in storage but there is just not any room to store them. The front desk will also hold extra supplies because there is no other place to put them. Many of the issues that occur with the floor plan and the cluster fall on the shoulders of the employees at the front desk. Somehow, they get stuck trying to fix any issues the hospital’s customer’s face and satisfy their concerns. This contributes to the problem of the front desk being a bottleneck, which disrupts the flow of the hospital and contributes to degradation of the customer experience.

### 2.4 Phone Triage

The phone lines are experiencing similar issues as the process flow. There is a larger volume of callers calling in due to the clinic’s popularity, and their current system needs to be modified to satisfy a higher volume of customers. Also the level difficulty is too high in navigating through the phone protocol. Customers are having a hard time
following the phone menu and get frustrated and press 0 for an operator or end up
hanging up before they are even assisted.

There are just too many instructions at once. Figures 1-3 show FHSA current
phone trees, which shows calling options for normal weekdays, weekends, and holidays.
This makes it too hard for the average customer to understand. The problem is that FHSA
does not want to lose loyal customers, so adjustments to not just their phone triage but
also their facility and process flow are needed to improve efficiency and customer
satisfaction.
FIGURE #2
Night/weekend greeting
FIGURE #3
Holliday greeting
3. Literature Review

In order to create a credible analysis, we had to research and read several articles to collect enough information to validate our analysis. A literature review section was arranged to generate information that could be used to compare the current process flow and phone system at FHSA to the process flow and phone system at other similar organizations. These comparisons helped us create improvements that could be implemented within FHSA. It can help them increase efficiency, while maintaining their excellent quality.

3.1 Veterinary analysis/ comparison

Our team decided that, in order to help improve the FHSA, we must research other veterinary hospitals in order to get an idea of how to deal with these issues. We looked into two other successful hospitals and an animal shelter, including University of Illinois at Urbana-Champaign’s veterinary hospital (Whitson and Kunkel, 2011), Loomis Basin Veterinary Clinic (Beyond Indigo Pets, 2011), and Animal Care & Control (AC &C) in New York City, NY (Tark, 2009). All three organizations had very similar approaches about how to make their hospital more efficient.

The similarities they all had involved building quality. Customers want to bring their pet to be taken care of in a clean and upgraded environment. The common upgrades between the three clinics were replacing incandescent lamps and old exit signs with energy efficient compact fluorescent lamps and fixture, and new light emitting diode (LED) signs. Improvements included cleaning air ducts to improve air quality within the hospital for the owners and the pets, setting up solar power panels to conserve energy, and setting up water-efficient dishwasher and low-flow toilets to save water.
company decides to take time to improve the hospital for their customers it tells the
customers that they are important. Several years ago, FHSA separated the waiting room
for the small hospital, one side for dogs and the other side for cats. Barriers were set up to
make sure cat and dogs could calmly wait before going to their appointments. Setting up
the walls isn’t the same as changing the lights or clean air ducts, but they are done with
the same intention to improve customer comfort.

Loomis Basin (Beyond Indigo Pets, 2011) and AC&C (Tark, 2009) both had
unique strategies for efficiency; Loomis Basin for example informed their community
about the improvements their organization was engaged in. For example if Loomis Basin
was going make some eco-friendly reconstructions in their examination rooms, they
would inform their community through newsletters, email, etc. By updating the
community of their engagements, they’re getting the community involved in their
organization to build loyalty amongst the community, which gives an organization a
significant amount of loyal customers (Tark, 2009). AC&C decided make their hospital
more comfortable for the pets. They hired more employee and created numerous new
positions and programs for the animals. They provided an around-the-clock vet tech for
the animals and hired several canine enrichment employees to ensure every dog was
walked each day, which reduces stress and boredom for the dogs. They added brand new
dog runs and larger cat condos, and also hired adoption counselors to provide one-on-one
customer service for potential adopters. AC&C also mandated that all animals receive a
toy and blanket each day, to make their stay more enjoyable and comfortable. These
unique adjustments to the operation makes an organization stand out amongst its
competitors. In a similar vein, the FHSA added a zoological companion animal service to
its small animal hospital. This made their clinic more versatile and able to work with various animals, which will give them a wider range of customers and business opportunities.

During our research we found very few complaints about other Veterinary Clinics; those we found included bad practices, bad payment plan, and lack of customer interaction. In one case a customer was complaining that their pet rabbit’s doctor went on vacation and the doctor that replaced their doctor gave the rabbit the wrong treatment (Burden, 2006). Another complaint was that the service was too expensive for the customer to afford, which could be settled with a payment plan for customers in need of aid (Favre, 2002). Through our research we found that common complaints about Veterinary Clinics are on having poor service/pricing or poor building quality.

### 3.2 Phone Tree and Interactive Voice Response (IVR) Systems

The team then decided to look closely at the characteristic of good answering systems and then compare it to the one at FHSA. We specifically looked at three very similar articles, and analyzed the differences and similarities. Establishing a phone triage will not help the business if it is not carried out by the staff. The protocols should be written down, handed out to the staff, and expectation of its implementation should be made clear amongst the staff (My Medical Malpractice, 2011). The phone triage should outline who in the office can take calls, which calls should be transferred, how emergency phone calls should be handled, etc. Also for commonly seen minor problems an outline should be established for how to handle the issues, so that the caller won’t need an operator and stay on hold. Also a good phone triage has all their calls
documented and put in the patient’s chart. A good phone tree has a lot of staff involvement because the customers are calling to talk to the staff. The staff members that are frequently called should set up their phone line with directions that they would use on a day to day basis when customers walk into the hospital.

We learned that a good triage technique needs the clinician to be comfortable and alert, but not anxious. By that they mean that a triage employee should be assertive not aggressive. A triage should have employees that listen, negotiate, and effectively influence other people. The triage should be simple and make the callers feel comfortable. An aggressive triage is loud, high pitched, tense, fast and overwhelming, using angry tones. Indirect aggressiveness can make the caller uncomfortable as well, such as sarcasm, insulting the caller, and negativity. Also the operators can’t be passive, such as whiny, mumbling, or monotonous/slow. The operators’ tone should be clear, audible, steady, and flowing (McKenna, Hill, and Feeney, 2006)

There are several characteristics of a good phone protocol. The first thing it needs is **validity**; if the step the protocol gives the caller is followed then the problem will be solved. It needs **reliability/reproducibility**; if the callers give the protocol their data the protocol would give them equal results to a nurse. It needs **clinical applicability**; protocol needs to state population to which the caller applies to. It needs **flexibility**; which is having a user’s guide with complete operating instructions, it should include assumptions and exceptions to recommendations. Finally it should have **clarity/user friendliness**; protocols should be written in unambiguous languages using defined terms in an easy to follow mode of presentation. A great protocol has an annual review and
updates, and also comprehensive coverage on presenting problems (Source 14, Wild Iris Medical Education, INC, 2011).

3.3 Facility Layout

A facility layout should be formatted and defined by the general pattern of work flow. There are three basic types of process regarding the layout; process layout, product layout, and a fixed position layout. A process layout is a format in which similar equipment is grouped next to each other in a certain area. In relation to the veterinary hospital this would be the tools the doctors use to treat the patients either in a regular exam room or the emergency room. Product layout is a type of organization in which equipment and work processes are arranged according to the order in they are used. Most product layouts are like an assembly line, but can also be related to the clinic we are working with. The pharmacy and a pharmacist should be in a straight line to the customers and the front desk. There should be a better process flow for the product i.e. locating the pharmacy near the customer with the ability to answers and questions they have in a timely manner. The third and final process does not relate so much to our project; it is the fixed position layout. In this type of layout the product remains and one location and the manufacturing pieces of it are moved to the where product is.

Layout planning procedures do not just happen overnight. They need to be thought about discussed and diagrammed before they are put into effect. The layout of the vet clinic has some challenges, which may be the root cause of many of the issues this hospital is having.
3.4 Systematic Planning

Systematic layout planning is an approach that may possibly be of some use in this project. This type of planning is possibly the best-known and most widely used form of layout planning. There are six main steps to systematic layout planning.

1. Chart the Relationships
2. Establish Space Requirements
3. Diagram Activity Relationships
4. Draw Space Relationships
5. Evaluate Alternative Arrangements
6. Detail the Selected Layout Plan

Chart relationships are used to see which offices and parts of the building should be grouped near each other. This is done so by a graph that shows the importance of each section and what its relationship is to the other sections of the building. For example, it is not very important for the break room to be the exam rooms this is something that would be categorized as unimportant. After it is established what is most important and how they relate it is now time to look at the space issues. Which rooms are the biggest and best suited for a certain job. It’s not logical to have the break room being the largest room when that might actually be better used for an office or an operating room. Based on the relationship chart and the established space requirement you can start designing an arrangement to which the facility should be changed. Using the previous diagrams created this task should allow you to get a better idea of what you want your facility to look like.
With the veterinary clinic creating these diagrams and using systematic planning may be essential in aiding them in the reconstruction of their facilities. Using a type of systematic planning can prove to be very helpful. This type of planning has the potential to solve many problems including the problems with the pharmacist and the flow of both the exam and the waiting room. As mentioned about systematic planning may be the best possible solution when attempting to fix the facility layout of the veterinary hospital.

3.5 Process Flow Analysis

The group decided to look online to find research on process flows for veterinary clinic, but not many were documented. We did finally find one, and it can be view in figure four. The First step is the waiting area, and this is where the owners wait with their pets to register. Then there is the registration step, where the owner gives the necessary information to the front desk. Followed by the preparation, where the doctor prepared the animal and the room for the exam or operation. After that the next step is surgery/checkup, where the doctor works on the animal. Then immediately follow by the next step which is called immediate recovery, where the doctor checks the animals pulse, temperature, and respiration measurements. Then later on they take on the next step which is later recovery, where the animal wakes up and are able to walk and all the discharge instructions and vaccination records are being prepared for the pet owner. Then the final stage of the process is the discharge, where the discharge instructions and vaccination records are handed to the owner and the owner may leave the hospital with their pet (Slide share Inc. 2011.). This is very interesting because FHSA has a check out
process in their process follow, which could mean that they have a slower process than the average clinic.
3.6 Data Collection for Process Analysis

Other than researching the group used a few other methods to collect data, one of them was a method called shadowing. Shadowing is a tool that companies use to train their employees and to test the service of their business, and it can be used to collect data to understand process flows. We shadowed some veterinarians to understand vet process flows. There are pros and cons to shadowing. One advantage to shadowing is that as a business or a project group like us, we get a firsthand experience to what is actually going on in the organization. It allows the group or business to see where the strengths and weaknesses are in the service being provided, whether it be waiting time or just how long the process is in general. One of the main cons to shadowing is the idea that because a person is being observed, they might change their normal procedure which can have an effect on the outcome of the event being observed. For example if a worker knows they are being watched the will probably be more attentive to what they are doing and try to perform at a high level. However if there was no one watching them they might just do the bare minimum to get the job done. Another disadvantage would be that a worker who has been doing their job for a while may not be too fond of the idea of being watched as they perform their work. These pros and cons are not only issues we will be dealing with in this project but issues that companies and businesses run into on a daily basis.

Also the group decided to go into the hospitals and time procedures to gain data on the average time spent in a hospital. The group went into FHSA and timed when the customer entered the room, when they checked in, how long the customer waited in the waiting room for the doctor, how long did the examination take, and how long did it take the customers to check out. These times helped use give FHSA a better idea of how long
their process is, so they can make adjustments if needed. We gathered 200 procedure times to get an accurate average. These averages were then used in our analysis; they helped us think of improvements that FHSA could implement in their process flow.

The staff at FHSA also helped us in our data collection process, by handing us requested information. They gave us files on their phone tree, floor layout, and different services. They also let us walk around the hospital and take notes on their process flow during their working hours. Then after we were done taking notes, they allowed us to ask them questions. Their answers were then recorded; this helped our group significantly because we knew what areas to mainly focus on.

4. Methodology

Our goal for the project was to improve FHSA’s phone tree, and to reduce wasted time during the process flow, but maintain the same excellent service that FHSA already provides. There are many methods for problem solving, but we used Six Sigma and its core methodology of DMAIC. DMAIC is an acronym that stands for the five sequential phases of the process: Define Measure, Analyze, Improve, and Control. The Define step requires a group to identify the issues we hope to address as well as set clear goals for the project. Measure is the act of developing of key metrics and collecting data, both qualitative and quantitative. Analyze involves the application of business knowledge to the data in order to determine root causes of the problems the sponsor has, which will then be Improved in the next step. The final act, Control, puts mechanisms in place which will ensure that the improvements of the previous step remain active and effective by providing feedback which will allow processes to self-correct.
4.1 Initial Define Step

When first approaching the project with the Foster Hospital for Small Animals at FHSA University, the group sought to familiarize themselves with the sponsor’s needs and concerns. The best method for tackling this important, foundation-laying step was to take part in an initial site visit. A tour of the facility, coupled with a dialogue between the group and various parties among the sponsors, helped to shape the direction of the project. Identifying the key problems at hand, and assessing our own ability to address them (with regards to the areas of our expertise), allowed us to formulate a proper problem statement. By selecting a few specific areas for improvement, namely the hospital’s telephone network and the general process flow, the group was able to focus our efforts in areas upon which we can have the greatest possible effect.

Once we settled upon the main thrust of our project, it behooved us to delve into the subject matter at hand and build a base of operating knowledge. Performing secondary research on both telecom system structure and veterinary clinic business practices provided important context within which to frame our work, and refreshing our studies on process flow and layout theory made for a welcome update on material that was vital to the project. In the course of our research, we found that there wasn’t a great deal of widely available reading about the meta-processes of animal hospitals. There’s a great deal of information available on the subject of medical care, medical research, and day-to-day administration in regards to veterinary facilities, but far less involving the application of higher-level business theory.
4.2 Measure

For the phone tree objective, we started by researching answering machine systems and comparing them to FHSA’s current system. Then we made several phone calls to analyze the system; through our phone calls we can get a better idea of the customer’s experience. We hope to improve the overall service level, as well as cut down on the number of call transfers and aborted calls.

When it comes to the nuts and bolts of process flow study, the initial steps are seemingly simple, yet remarkably important. Our first steps involved figuring out what the current process entails. As discussed in the Literature Review, the main information gathering technique we utilized to study process flow was shadowing. By following patients/owners and care-providers, and taking detailed notes, we provided a current portrait of how the Foster Hospital for Small Animals operates. We identified the various discrete steps that comprise the patient experience, as well as identified possible areas for improvement (bottlenecks, redundant steps, wasted time or supplies). We measured the length of time various steps of the process took, as well as possible causes of any bottlenecks or defects in the process. Furthermore, the FHSA is interested in improving its workflow surrounding exam room usage. There are often rooms not in use because they’ve been reserved, or are soon to be in use, while there are patients who could use those vacant rooms. By improving the speed and precision of the clinic’s work process, as well as reducing its waste, we should see improvement in the secondary (and less tangible) area of customer satisfaction.
4.3 Analyze

Compiling our initial findings and studying them allowed us to produce process flow diagrams, which are an excellent way of visualizing the process puzzle for both the project group and the sponsor. Once we established the general procedure of studies, we produced concrete information as to the exact types of data we collected, which then informed the precise nature of the analysis. A combination of statistical analysis and logic-informed qualitative analysis provided a comprehensive look at the issues studied. The analysis took place in both the hospital and outside of the hospital. Within the hospital we took notes on what goes on in a day to day basis, and outside of the hospital we analyzed other hospitals compared to FHSA. We had the same approach for the phone system, but we didn’t have to go within the hospital to analyze the phone system. We made a significant number of calls to analyze the phone system that was currently being used and we compared it to other phone trees being used. This approach helped us gain a better sense of what had to do to help FHSA, and helped us come up with helpful ideas.

4.4 Improve

In order to improve the customer relationships at FHSA we focused our efforts on shortening the phone tree and timing the processes. In order to produce a phone tree smaller than the one before we needed to eliminate options that were not needed and combine those that were related. Through calling and testing the current system we were able to get an idea of what options were too sophisticated for customers to understand and potential options that we could eliminate. Once we made our first draft of the new simplified phone tree we presented it to FHSA to receive feedback. We then used their
comments to create the perfect phone tree for FHSA. For the processes and operations we focused on timing the steps. This focus on timing gave us the foundation to base our suggestion and recommendations for improvements. Timing the process allowed us to determine what parts of the process needed change. The processes that had the highest wait times and most variance were the ones that we concerned ourselves with the most. Putting emphasis on the check-in and check-out phase we were able to determine the problematic areas according to our timing results and make suggestions based on personal observations and timing results.

4.5 Control

Finally, after completing the improvements, we provided detailed recommendations about how to implement changes into the system and sustain them. Process monitoring is the most important step, as awareness can head off encroaching issues before they become more complicated. Monitoring all implementations and their effect on the processes can demonstrate whether the implementations are good and need no further modification, whether they are bad and a different approach needs to be taken, and lastly, if the new implementations are no better than the last. Each result affects the next steps in controlling the improvements. If a new implementation proves to be more efficient and effective than the process it is replacing, then only further monitoring the success is required. If the improvement results in the same results as the previous practice then the one that is less stress on the staff should be chosen for the current time, while new options for improvement should be explored. If the new improvement fails to be more efficient or effective as the last then exploring new options is needed.
5. Results

5.1 Phone Triage

At the start of the project the group handled the issue involving the veterinary clinic’s phone operating system also known as the phone tree. On a couple of occasions we brainstormed with the management of FHSA to come up with the best possible solution to fix their phone tree. After a great deal of research a discussion we devised a plan to improve the clinic’s phone tree. Our results are summarized here.

In chapter 3 of this report we discussed and reviewed some of the elements needed for an effective and efficient phone tree system. This included the validity of the phone system, the reliability, the clinical applicability, flexibility, and the user friendliness of the operating system. After the reviewing the elements of a good answering service the team read the backup script the staff at FHSA gave us. We analyzed it compared to what we learned from our research. FHSA’s protocol is a good protocol and has a good protocol’s characteristics, except clarity. The protocol directs customers, according to their issues, to the proper line. The protocol even gives out directions to the hospital to out of state customers and it provides a payment plan options.

It is well organized by Night/Weekend, Weekdays, and Holidays. The protocol even has a backup plan in case of bad weather conditions called “Weather.Closed”. The problem is that it is too sophisticated for the average caller to comprehend. The customers don’t trust the protocol if it’s too complicated and end up taking the easier route, which is pressing 0 and talking to an operator or hanging up.
Based on these attributes and our review of interactive voice response (IVR) system design, we explain to FHSA a way they can improve their operating system. Their phone tree had three scenarios, Weekdays, Nights/Weekends, and Holiday. All three scenarios had different numbers, for example if the customer dials 3 during the weekday they will get the small hospital and if they did the same during the nights/weekend they will get the wild life clinic. This can get very confusing because if the customer regularly calls during weekends or nights for wild life, and then has an emergency during the week and calls and dials 3, they would find themselves in a different place in the operating system possibly causing confusion and frustration. Their operating system had 7 or 8 options, which can be very frustrating and time consuming for a customer calling in for an emergency. We decided to use Microsoft Visio to show the staff at FHSA a visual of how their phone system looked like. FHSA’s original phone systems can be seen in the following figures (Figures 1B & 2B).
Figure 2B
We recommended to FHSA to create one answering system, instead of three, that would be consistent and suitable for any occasion. FHSA understood and agreed that consistency was important in fixing their phone tree. The group also suggested that FHSA eliminate the non-important lines to reduce the amount of time a customer has to wait online to hear all their possible options. FHSA agreed with the group and through brainstorming we were able to cut the phone tree down to 5 options. These options included emergency, small hospital, large/wildlife, directions and operator. This shorter list of options covered all of the potential problems a calling customer might have. We regrouped and made the suggested adjustments to help simplify their answering system. First we made the system more consistent by setting certain numbers to certain departments. We made one phone system, and eliminated the other two phone system. We did this to add consistency and reduce the chances of a customer ending up in the wrong department. Another recommendation FHSA agreed to implement was to make a direct line for the large animal hospital, which we created in our improved diagram. The improvements can be seen in the following figure (Figure 3B).
Then after we presented our new improvements for a second time, we were able to receive more feedback and collaborate with FHSA to create a final phone system. We decided to go with four separate phone systems that would lead the customers to their appropriate departments. The large hospital, small hospital, wildlife, and administration (non-emergency) would have their own phone numbers. Wildlife and the large hospital will have direct lines to a medical technician in ER, while the small and administration will have a couple more options due to them dealing with more case throughout the year. The new answering systems all have consistency and simplicity as shown in the following figure (Figure 5).

(Figure 3B)
(Figure 5)
5.2 Process Flow

The hospitals process flow was a major problem that FHSA wanted us to investigate. By process flow we mean the way in which the hospital operates. From the amount of time it takes to check in to how long you are waiting before you are seen by a doctor. Beyond the major banners of “process flow” and “phone tree”, of particular interest to the sponsor is the entire discharge process, as well as wait time between vet students taking the patient history and consulting a clinician. As currently constructed, the discharge process can be needlessly long and complicated, which has resulted in patients leaving without taking important steps such as picking up their medicine. It is important, however, to stratify our results by department, as orthopedic problems (broken bones, for instance) often take less time to deal with than, say, radiology or oncology.

Our goal was to observe this process flow and see where the issues and bottlenecks were. We shadowed both Veterinarians and patients to see these processes. Along with shadowing we timed the processes of the hospital to see where there were issues. A day’s schedule at the hospital is generally broken down into three main parts: rounds, receiving, and procedures. Rounds takes place at the beginning of a shift, and involves the attending reviewing the status of his or her various inpatients (patients held in the hospital) with the other doctors. This is important medical work, but largely immaterial to our project, because we focused on aspects of the process with more customer interaction. Receiving, however, encompasses the core of our project. This is where doctors see clients (pet owners) and patients (the pets themselves), either by appointment or by walk-in. From our study, an average appointment is usually structured as such:
• A doctor peruses the patient’s files to acquaint themselves with the animal’s medical history, both with this specific malady (if it is a recurring issue) and their overall health.

• Then, the doctor retrieves the client and patient from the waiting room and brings them to an exam room. Exam rooms are assigned to a specific attending for their scheduled receiving period, although if there is overflow an alternate room must be secured.

• There, the doctor takes a patient history from the client and performs an examination of the patient. This is the time where a hypothesized diagnosis is formed, and initial tests such as temperature readings, skin scrapings, or blood drawing may be performed.

• Then, if the doctor is not an attending, they will consult with the attending that may then perform their own exam of the patient. This begins a cycle of consults and exams with doctors in whatever departments may be required. If the attending believes there to be a surgical solution, a surgeon will be called in for their own exam. If he suspects cancer or bone/joint issues, an oncologist or an orthopedist could be consulted.

• Finally, the patient will either be admitted for care or discharged. In a best case scenario a patient can administered a treatment (and any relevant medication) and released over the course of the appointment, but they must often stay in the hospital for further tests and observation. The discharge and admission processes are largely the same, in that they involve providing information and payment to the front desk. This concludes the appointment.
5.3 Process Flow Observations

During visits to the clinic the group took notes on their observations, these included timing how long a person is waiting in the waiting room, how long the pet is gone for, and how long it takes for the customer to be discharged. We observed most of the services that the hospital had to offer. These services included radiation oncology, cardio, neurology, ophthalmology, soft tissue, medicine and orthopedic. We documented many of the times leading up to the actual operation or service. An example of this is how long the customer was waiting before the actual exam or procedure began. Three forms are printed out one for the hospitals records, one for the owner and one for the referring doctor. After the doctor completes the forms he or she then returns the initial information back to the clerk and the clerk fills out a bill and discharges the patient to the owner. The group discovered that not every procedure takes an hour, so if time runs out on the doctor then the doctor has to finish the process in either another room or in the hall. The last part of the process is typically informing the owners of the problems and how to treat it, even though it is just talking the doctors and patients prefer to have a room through the whole process.

Our data collection was analyzed into 6 different sections; the check-in (100 observations), check-out (35 observations), exams (32 observations), and observations by service. We also analyzed the data based on which days, Wednesday observation, Tuesday observation, and Thursday observation. Across observations, we calculated the average times for the start, finishes, and check points as well as the standard deviation.
The data collection and analysis that was done helped to better understand the flow of the hospital as well as create the potential for suggestions.

Our initial goal was to track the services provided, however conflicts arose when we began our timing observations. It was difficult to track the services for numerous reasons. When it became busy, doctors began to use whatever rooms were available rather than follow the exam room schedule. Coordinating the patient being observed between the student in the exam hallway and the student in the waiting room was another difficult task to overcome. Although we were faced with difficult challenges we were able to monitor some services and retrieved data for those processes. Figure 6 summarizes the differences in process times for the different services. Although this is generated from a limited supply of data we were able to generate average times for each service and compare the variation between them.

(Figure 6): Average Exam Room Time by Service
Our analysis showed that the number of patients checking in and out of the clinic was different from day to day and that some days were busier than others. The data we collected showed that there were more patients seen on Wednesdays and Thursdays than on Tuesdays. Using this information the hospital can decide whether or not it would like to have more staff scheduled to work those days to help support the rush of patients coming in. In relation to the difference in volumes on different days, it is important to also note the numbers of scheduled appointments compared to the number of people coming in who are not scheduled.

Another important analysis made from these observations was between the average check in and checkout times. One of the issues the hospital presented to us during our observation was that they were concerned that it was taking too long for patients to be checked out at the end receiving a particular service. Our data analysis showed that the average check in time and check in process was 3 minutes and 8 seconds. The variation of check in time and the process is 3 minutes and 4 seconds. Comparing this to the average check out and check out process which was 15 minutes and 42 seconds with a variance of 15 minutes and 15 seconds, we realized that there was an issue here. Figure 7 shows these averages and variation times. These results allowed us to brainstorm ways to make the average check out time similar to the average check in time, which in return would help the process flow of the clinic.

<table>
<thead>
<tr>
<th>avg check-out wait</th>
<th>0:11:54</th>
<th>std. deviation of check-out wait</th>
<th>0:10:41</th>
</tr>
</thead>
<tbody>
<tr>
<td>avg check-out process</td>
<td>0:04:48</td>
<td>std. deviation of check-out process</td>
<td>0:04:34</td>
</tr>
</tbody>
</table>

(Figure 7)
Doing these observations every week proved to be a difficult task during this project. Sitting in the waiting room it was difficult to tell which patients have already been seen or check in. We began to fix this by documenting the patients as they walked through the door. That proved to be unsuccessful when patients began coming in to pick up food or a prescription. When this happened there was no check-in or check-out process which made it difficult to document. Another alarming issue that was most difficult during the analysis was when the hospital was very busy. We did not have the manpower to follow each patient that was walked to an exam room to mark when the doctor or student was in there with them. Also with the hospital being busy it was very easy to miss when a patient left their exam room. All in all our data collection and analysis was a success and we were able to provide a number of recommendations and suggestions to FHSA to help improve their process flow.

5. 4 Process Flow Suggestions

Our group has several recommendations for the veterinary clinic based on our process observations and analysis. Our first suggestion was to designate a different desk for the customers to check out and be discharged from or to relocate the check-out desk completely. After watching the process of the waiting room for a couple weeks we noticed that customers are having a hard time checking out in a timely manner, our data supports this. In some cases people are not being noticed when they are in the waiting room. They may have walked into a crowd of people and felt that they were on the schedule so they don’t check-in rather they just sit and wait for their name to be called because of scheduled appointments. The front desk may delay in calling them as a result
of them not being acknowledged as in the building. In other cases, the time when the
doctor returns exam information and the time that people return to the waiting room from
their exam may be different. This results in the staff at the front desk calling the names of
people whom are not present in the waiting room, then once they are present they aren’t
called for long periods of time because the clerks from the front desk have put the
information back because of no response to their initial call. If one section were assigned
for discharging patients, we feel it will make the process run much more smoothly.

Another suggestion our group had to the clinic involved the step when the doctor
puts the patient information in the folder for the front desk to discharge or bring to the
pharmacy. As of now the only indicator that the staff knows the information is there is if
they are told. We recommend that some sort of bell or flashing light showing when there
are papers waiting. This will not eliminate all human error, but has the potential to help
fix this issue. Some type of notification that the information is ready and available is
needed here. Although doctors know the information is there now, the clerks are faced
with a lot of tasks to accomplish; it is not unusual that clerks forget about the information
or put the information back because of lack of response. How long is has been there is
also important. A software program to monitor the paperwork is another idea that can
produce effective results in this situation. Eliminating some of the wait time with this
issue can lead to faster checkouts and discharges, as well as prescriptions getting to the
pharmacy in a timelier manner.

One of our more important suggestions was the scheduling of the exam rooms.
Although much of the exam process we did not want to manipulate or change because of
lack of clinical expertise, we have one suggestion about the scheduling and management
of exams and exam rooms. During our observation we noticed that as of now there are multiple times during the day when there are open exam rooms and patients waiting to be seen. The rooms are said to be “scheduled” but are not occupied. Our group is under the impression that this issue is causing the hospital time, which is money and potential loss of clients. We recommend that the hospital change their scheduling system, so that they can respond quickly when appointments are missed and rooms are not being used. One possibility for this would be having a plan B for every appointment, for example if patient A does not show up then the next doctor who has an appointment should be allowed to use that exam room for patient B. Other patient and customers arriving at the clinic should not be penalized and have to wait longer because another patient was not punctual and did not keep their appointment time. These improvements will not only help the process flow and clear out some bottlenecks for the hospital but will also benefit their customers and their patients.

There are also times when all the rooms are full and there is nowhere to see the patients, which in turn results in longer time spent in the waiting room and more distress added to the owner and patient. We recommend creating, training, and improving strategies to accommodate these situations. Having plans in place for when there are excess rooms is important as well as when there are none available. One example would be having rooms available just for distressed patient until they can be seen by the doctors. Another would be being prepared to have students spend some time in the waiting room to show the patients and customers that they have not been forgotten about and their well being is important to the clinic and its staff. Making sure that all employees understand these strategies and have the knowledge and composure to execute them in the time of
need is just as important as the idea. Furthermore, making improvements and changing the dynamics or way people have worked is an operation that takes time, and conflicts can arise with new strategies. For it to be successful it has to be a high priority for all employees.

6. Conclusion

When this project started the goal was to enhance customer service focusing on The Foster Hospital’s answering service and the process flow at the FHSA. Plans often change and initial ideas are always being innovated and added to and this project was no exception. However we learned as we progressed. This continuous pattern of learning allowed us not only to get better with our analysis and observation techniques as we moved along but also made our suggestions and opinions on the defined issues of FHSA more credible because of our growing expertise and knowledge of the processes. Because of the time and effort spent in observing and understanding the mechanics behind Veterinary practices we were able to provide insightful suggestions that will improve efficiency and increase customer satisfaction.

6.1 Project Summary

After weeks of visits, making observations, and presenting information we finally were able to make suggestions that we believe will improve customer service at FHSA’s Veterinary Clinic. Through the use of six sigma and the DMAIC framework we were able to define potential issues, measure those against common success practices, analyze the processes and gain further knowledge, and then recommend different strategies and
techniques to implement that we feel will improve the efficiency of the small animal hospital. Controlling these implementations and making sure that the continuous cycle of learning and improving the process does not end is crucial. Monitoring the current levels of efficiency and customer satisfaction and making sure that continuing to improve is important and arguably the most important concept of the DMAIC framework.

We defined two specific focus areas to support on for our goal of bringing more efficiency to an efficient process. These two areas were the phone tree and the process flow. Because we were able to essentially become the customer and make phone calls to the clinic we quickly gained a sense of the exact confusion and misunderstanding that the customer could experience when calling the FHSA. With our background knowledge we were able to identify these potential confusion points and make modifications to the current system while still accommodating the structural needs of the clinic. With feedback from FHSA’s liaisons, we were able to combine their ideas with our initial suggestion for the answering system and devised what we feel is a much more efficient and easier to manage system that breaks up each major division of the animal hospital into their own phone system. Each phone tree is much smaller and less confusing than the combination of all the components in one.

Looking at the process flow was more of a challenge because we could not become the patient unless we followed one around. Because this is time consuming it would result in other potential data being missed while observing very little. This made understanding the customer’s point of view harder to see unlike the case with the phone systems. However we managed to observe specific process times as a foundation for analysis. Timing the different phases of a visit to the vet gave us an understanding of
where customers may be getting frustrated as a result of waiting. Also this focus on process time helped us make suggestions as to what areas of the process potentially needed to be reevaluated and modified. Our main concern while making observations was the waiting room. We specifically focused here because we felt that the process as performed in the exam room are necessary to meeting the concerns and needs of the visit, and not our area of expertise.

We observed the check-in process was very efficient, especially when there was someone in front to greet incoming patients and check them in before they even reach the front desk. However, people can become lost in the waiting room both during check in and checkout processes because of crowding, or if people don’t properly acknowledge themselves when entering the waiting room. For these reasons we suggested either dividing the front desk into two different sections, one solely for check ins and part for check outs or putting them in two different places to better manage the flow of patients. Furthermore, there should be some type of indicator that lets the front desk know when a patient’s information is delivered to the front desk from the doctors. Changing the dynamic of the front desk without adding more tasks or complicating the process is essential to improving check-in and check-out efficiency.

6.2 Moving Forward

Projects rarely go as planned; there is always some type of variation or uncontrollable factors that come into play. Although we did not know in advance what issues or obstacles would arise we learned to handle them successfully by keeping in close contact with the staff at FHSA to constantly update them on the work that we were
doing and to make sure that we were working toward a common goal. Good communication allowed us to be able to mediate through most problems and come to a joint agreement and understanding of the next steps to make this project a success. This made both parties happy because we both knew what to expect and what direction the project was heading in.

Once recommendations have been made and adopted it is important to monitor the implementation and results. Requesting feedback from customers and patients and measuring and evaluating increasing efficiency is important. Asking customers to test trial the phone service would be ideal before complete implementation. Even after the system has been changed it is important to monitor customer satisfaction, making sure that new customer needs or concerns about the system are taken into consideration and modified for satisfaction. Reevaluation of the process flow is important as well. Continuing the observations started here can lead to further insight about specific services and information regarding processes, asking for customers’ opinions about the system and incorporating them if it is feasible. Making sure that wait times or processes are shorter and have less variability can be used as a control to ensure increasing efficiency.
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