Field Engagement Paper

CMAT 465

Fire Department Group

Josh Johnson

Lexi Marquess

Michael McLean

Melissa Wainaina

Our organization of the fire house needed to know on how to advance their technology within their department in Salisbury. Most of the technology provided to the firehouse is county funded so it was kind of difficult to come up with solutions for them to make right away after our recommendations. With county funding being the main source of capital our group is going to give a recommendation to give to the county and the department on what we think would be the best possible outcome. The personal significance of this project was to see how different individuals had different opinions and conflicts with the technology they use on a day-to-day basis. The social significance of this project was for our group to learn and comprehend the technology the fire department uses to ensure safety in our area. This is useful because then the members in our group know the inner workings of the fire department to give them the best recommendations we can give them. We also had the privilege of interviewing volunteers and career firemen. This gave us a double point of view of how the technology was running by two different types of employees. One of our main key findings within this project was how the fire department was trying to configure over to a secure cloud system. This is very important to them because most of the information taken by the firehouse is extremely confidential and should never be shared with any civilian for personal use. With this being said our main focus with this project was to research and find a secure network for the county to provide to the Salisbury fire department. This then ties up with our main research goal was to find the firehouse a more secure network to run day-to-day operations more efficiently and effectively.

Type of Technology:	Role Designations:
Radio System	Every member of the firehouse has a radio to wear around the fire house and in the field to communicate with each other and the call center.
GPS System	GPS is used in the firehouse and on the vehicle's computers that are used for their operations.
Two-Way Computer	This system connects the fire department with the central dispatch system.
Windows Computer	Windows is the basic computer model used throughout the Salisbury fire department.
Alarm System	This system has 2 buttons that the firemen can push to trigger a call that goes throughout the fire department via two different types of loud alarms.

Within the organization some processes that they use are the inter organizational schedule network. With this network the firemen can download the fire chief application to view news within the department and to view when they are up to work. This application would be an inter

and intra network. It is an inter network because all of the information is put up by member of the department. This is also an intra source because the application is ran by an external company than is provided to the department for their needs. One of the main policies our group observed with this application is the policy that only the chief and assistant fire chiefs can post information to firehouse reading purposes. This is a very important policy noted by asst. Chief Donaway because only the chiefs have the rights to tell the firemen the information that is important to them without any junk other members may feel like posting.

Going into theories, our group thought the Complexity Theories and ICT's was the most relatable to the fire house due to the communication side and keeping everything up-to-date. Artificial systems such as computing systems are characterized to have complex behaviors and have become known as Complex Adaptive Systems (CAS).

"CAS are dynamic systems able to adapt in and evolve with a changing environment," says Serena Chan who wrote Complex Adaptive Systems. For the fire department, they have a data saving system called FIREHOUSE software, but they need more up-to-date software that is more efficient (eg. cloud systems). On the class slides, Professor Argwall said that ICT's (Information and Communication Technologies) influence communication between parties. In the fire department's case, their communication with each other and the 9-1-1 call center is crucial. If they are not communicating, something could go wrong, where the responders go to the wrong location and delay their responding time; or the firefighters/EMTs could enter in the wrong information or diagnosis and the patient could have something more serious than they entered into the computer's system. So the communication between all of the volunteers and paid firefighters/EMTs at the fire department, the 9-1-1 call center and even the hospitals involved (to

let them know what are the injuries and what is happening with the patient) is very serious and should not be taken lightly.

The complexity Theory and ICT's definitely helped our group guide us to what we needed to observe and what questions we needed to ask during the interview process. We knew that we had to look at what kind of servers and hardware they had to see what we were working with. But also make sure to ask how they (the fire fighters, EMTs, Chiefs and Assistant Chief) stayed connected with each other and the 9-1-1 call center. Whether it be via radio, phone, texting or the portable computers they were using.

During the course of our time at the Salisbury Fire Station, we collectively notice a range of technological applications that are used to make the jobs of the EMT's, firefighters, and volunteers more effective. To help understand the use of these technologies, we took a census of the most important ones, observed them through predetermined time intervals, and came up with three overarching themes from cloud systems, security systems, and county funding. To help apprehend further why these three themes are important, the analysis of the apparatus must be done.

The Salisbury Fire Station is a very complex organizations where technology is the key medium to run the station. Major technological apparatuses seen throughout the organization are radio system, Mobile Data Terminals (MDT), computers, GPS system, and the alarm system.

The radio system is one of the essential technologies used throughout the organization, according to volunteer firefighter Kelly Stottlemyer, they uses the radio systems to talk to each other with different channels based on the call, if someone is on fire, EMS or an incident where

they need to switch to a channel, it is essential that the waves are not being interrupted by other Fire and EMS calls.

MDT: mobile data terminal, show where all the calls are coming from, and if it's a fire, on call, or on service. When the dispatcher calls in shows us where one going, who is going, and other things firefighters need for their reports. Reports are done on an online system, which is why computers are a key use in the organization. The use of computers are seen throughout the fire station and even in the vehicles they use, there are different types of computerized systems and applications used from the fax machine to MDT's..

Within the different rooms of the station, there are computer monitor and GPS system, this is beneficial to them because, if a call is incoming the person on duty can see an arrow where the area of the call is, and a map of the city in general. One can also see different calls from the police station to other apparatus. The use of pagers is also important because if a volunteer or firefighter is at home and the pager goes off, it will alert the person that they are needed. The alarm system is also a key apparatus, where these are about two specific tones to help alert what type of emergency is occurring and lets them know if EMT's are on duty or fire fighters.

It is seen that although the apparatus is complex a cloud system is lacking, and through our observations we saw how a cloud system would help innovate the work of the firefighters. A cloud system is a cloud "infrastructure" from Hewlett-Packard, which helps combine content, storage, servers, and other software. This would help save important documents, efficiently access documents on different apparatuses, and help everyone in the organization connect and access documents from home or on the job.

Security is also seen as something that is lacking. A security system in this context can be seen as a firewall computing system, of hardware and software that limits the exposure of

outside networks from attacking another system. According to Assistant Chief Donoway, if different and new technologies such as the cloud were to be installed a firewall would be a major concern. This is an important thing to keep in mind, because it can restrict the innovation and the improvement within the technological apparatus at the organization.

The last theme that is presented throughout these observations is the financial obstacles the stations face. It is seen that even though the station would like to improve technologies funding is an issue. A lot of the apparatus that are used in the station range from 500- 3,000 dollars and can even exceed more. The issue with getting new technologies is seen through state and county funding, which has to be approved by state and local governments.

Throughout our observational portion of our field engagement, we saw an abundance of innovative technologies, and we saw an opportunity to take what the station had to offer and improve the efficiency of the organization by adding a cloud system, a firewall, and help with county funding.

There are several themes that were pulled from our observations while at the Salisbury Firehouse. While at the firehouse, my group observed the themes that were obvious in relation to technology. The first theme was incorporation of a cloud system. The second theme was installing a security system also known as a firewall for their computer system. The third noted theme was the need for funding so the fire house can stay equipped with the new technology. For this half of the paper, will analyze the themes and relate them to the themes learned in class.

First I will analyze the first theme, incorporating a cloud based system in the fire house why would this be important? Well, with technology advancing rapidly and paper work becoming a thing in the past the fire house will eventually need a place to store their files and with a cloud system the many files they do have will always be available to them. Connecting the

theme of incorporating a cloud based system to a media richness theory. The media richness theory is a theory that frameworks how successful a medium is as well as how helpful it is. A cloud based system would be useful for obvious reason. The first reason being that their data and important documents will be stored safely and remain undisrupted until someone needs that data or document. This cloud system would be a secure system that allows firehouse employees to access data from a secure place giving them security knowing your data is in a safe place.

The second, theme was installing a security system with a firewall strong enough to keep their computers and data safe. The firehouse needs a secure security system so their data cannot be compromised. According, to the Assistant chief on duty, the firehouse has sensitive paperwork and confidential files that should not be accessed by anyone without permission. Connecting the security systems to the media richness theory and the complexity theory. The complexity theory relates to a secure system because human interaction in the fire house in a fire house is complex due to technological applications. The complexity theory, communications throughout other city organizations. Connecting the theme to the media richness theory, this will make their confidential computer information secure so they cannot be hacked or have the data that they deem important.

The third, theme observed theme was the need for more funding from the country so the firehouse can always be equipped with new technology. Although, from appearance the firehouse may appear up to date with their technology but there is always new technology that could better the fire house and make communication between them easier. This final theme, receiving more money for new technology relates to the media richness theory. If they receive more funding they will be able to have the state of the art technologies. According to an office

employee, "the computers are often slow because there is so much information on them". New technology would keep things like this from taking place.

While, on site we noticed that there was not, a cloud system to save their data. From there we came up with our research goal. Our research goal was to to show the Salisbury fire department a secure system that will be more efficient than their current data saving system now. We also notice, that there isn't a clear way the fire station can adequately communicate with the community through present day technological outlets. All technology is not new technology and advancements are being made rapidly in relation to technology. With that being said, I will explore why the goal we have will be the best alternative for the fire house. Focusing on our goal it is the best alternative compared to any other technology out there. Other ways to store data would be the old way paper, or saved up on one big hard drive. The cloud system trumps both options because it is easy, effective and will lost a lifetime.

If the firehouse was to incorporate a cloud based system, it would be more helpful than harmful. Little to no training is required to save your data on a cloud system it's literally a click of a button similar to someone saving a document on a desktop computer. If the fire house does not update to a cloud system, they will eventually have an issue three to seven years down the road ultimately creating a barrier between user and the technology. An example that a cloud system would be useful can be seen in the development of the newest firehouse. They have to move old paperwork to the new office but if they had a cloud system this would not be something they would have to worry about because all their computer data is saved in the cloud.

In conclusion, The Salisbury fire department has a stable environment and have great ICT's in place in order for them to remind in constant communication. Although, communication may appear complex the technologies they have in place are efficient for the time being but in

the long run the themes and suggestion behind our research support our goal, for the Salisbury fire department to incorporate a cloud system.

The Assistant Chief that our group interviewed during the interviewing process brought up the issue of the security aspect of the cloud systems. He first said that the way the fire department communicates with the 9-1-1 call center is by them sending notes over their computer system, which he felt was better than them blasting that same information over the radio stations. The general public has access to the radio scanners and is allowed to listen to the 9-1-1 scanners. The Assistant Chief went on to say that the fire department nor the call center is trying to hide anything from the general public at all. But when the people on duty start to talk about the patient's personal information, they begin to worry about HIPAA (Health Insurance Portability and Accountability Act of 1996).

The fire department has a duty Chief that communicates with the people that run their systems for them. They also have an incident reporting system (FIREHOUSE Software), that is used to manage their records and data. It collects calls that come from the 9-1-1 center, keeps their training records, health and safety records and activities they perform (E.g. fire prevention or public education). The fire chief said that they were trying to get out of base server and get into a cloud system.

"We are having problems with their software and our firewall... If the city does not have a good firewall, then were going to be jammed up with cyber-attacks." Said the Assistant Chief

Going back to our groups main goal, we wanted to show the fire department a secure cloud system that would be more efficient than their data saving systems now. Some recommendations our group has come up with are XMRFire (Emergency Service Consulting) and MSDSonline's Plan1.

The XMRFire, which is associated with Google and Google Apps, assists with websites and cloud services. The cloud services include "file storage, online hydrant databases, forms, video and multimedia service, online exams and certification for the public and employees, and custom solutions to meet your department's individual needs," which is stated on the XMRFire website. It also talks about secured data, saying "Your data is secured with our up to date software, round-the-clock website maintenance, and state-of-the-art US based data centers."

Our other recommendation to the fire department is MSDSonline, which is the leading cloud-based provider that manages global hazard communication (HazCom) regulatory compliance requirements. New to the MSDAonline program is Plan1. Plan1 is "a cloud-based chemical information sharing service that allows MSDSonline HQ and HQ RegXR customers to share critical hazardous product information, including inventory lists, floor plans, MSDSs, and more with you, their first responder community."

How it works is if a business has chemicals within their facility, the fire department asks them if they are MSDSonline customers, if they are, the fire department sets up the Plan1 connection, free of charge.

Plan1 provides first responders access to critical chemical information and company-specific chemical information anytime and anywhere they have access to the internet. Though this program is only useful for chemical related problems, this would benefit the Salisbury Fire Department. They would be allowed access to any company in their region, with chemicals on site, their emergency exit plan, chemical container maps and chemical inventory lists. The program would also benefit with the communication between companies and the Salisbury Fire Department and keep the city of Salisbury safe.

This class helped our group develop communication techniques that we used while we were working in our organization. First, our weekly readings helped our group use real life examples to use while comparing technology when talking with our liaison with the fire department. For example, in week ten we had to read the wireless policy which was the best practices and guidelines for location based services. This compared to our findings because the department uses all location based services on the equipment they use on a regular day's operation. Next, our daily readings and discussions helped our group on learning how to be a technology consultant. With the discussion part of the class this helped our members of our group learn how to communicate between people. This was a key factor because many people in our class had different opposing viewpoints that we had to discuss with and understand where they are coming from with their information. The class lectures gave us useful information about the policies and regulations concerning the different types of technology. For example, our group took many notes while discussing the different cloud based systems. We then used this information to talk to the chiefs of the firehouse with the different options that are available in the marketplace for their use. Lastly, having a real life instructor helped out as opposed to an online class. Having a real life instructor helps backbone on how our group was to communicate with someone of authority to show them respect and to be professional as well.

The first thing our group learned based on the theoretical intersections of this project was knowing which theories related to our project. Complexity theory was our main focus because this theory looked at the concept of the cloud and how complex the cloud really is. We learned the pragmatics of this project by dealing with the types of technology in a real life and practical matter. While being toured around the firehouse our group actually got to go inside all the vehicles and the compartments each vehicle had to get a better understanding of what we were

working with. Our group learned the regulatory measures of the fire department by interviewing several different types of firemen while in the interview process. While talking to the volunteers of the department they told our group the different regulations they have to undergo that differ from the career firemen. Such as, with the volunteers they have to work and be at the firehouse for a minimum of 40 hours per week. Also, volunteers either had to be a full time student or be employed in a company working an average of 30 hours per week to be eligible to be a volunteer fireman. The social factor our group learned was the hard work and schedules the firemen had to protect and serve our local community. For example, Assistant Chief Donaway told us his weekly schedule is to work 4 days straight in a row, twenty-four hours in a row then three days off following the four straight work days. We learned about the different cultural factors of the fire department by examining the different people that work in the department. The Salisbury Fire Department has a very diverse staff of all ages and ethnicities. Finally, the personal interactions within the department were fantastic. Every single member of the department that we talked or interviewed with were very happy to share information about their technology to help our group analyze the best possible outcome to share with them.

Observation Themes

Firehouse Group

1. New state of the art technology inside all the fire departments vehicles.
2. High security already in place in trying to safeguard the departments servers which are located in a computer room in the firehouse.
3. Workplace safety with equipment is very important to the department to follow to ensure safety within their members.

Barriers from interviews
Fire Department

Goal : During the time at the fire station, we noticed that there was not, a cloud system to save their data. We want to show them a secure system that will be more efficient than their data saving system now. We also notice, that there isn't a clear way the fire station can adequately communicate with the community through present day technological outlets such as social media: Facebook, Twitter, Tumblr, Wordpress, etc. We would like to see how they can incorporate these technological outlets to better their connection to the Salisbury community and how it can improve the work that they do at the fire station.

Themes throughout our data sources:
- County funded
- Cloud Systems
- Security

Michael McLean

In-Depth Observation Table

Framework Bullets	Technology/User Role	Observation—Needs, Barriers, Facilitators, Training etc.
Theoretical Features		
Rogers Diffusion of Innovation	Relatability — System taking too long to load, Trialability, Observability, Late Majority — or Microsoft, Early Majority	• Freeze in the office • Chrome over internet explorer
Garbage Can Model	People — Choices — No Accident on Twitter yet	• lots of downtime, could be wifi for new technology training
Media Richness	Ass. Chief	Mid-computer literate
Impression Management	Asst chief	• Different computer systems throughout the house
Technological Features		
Hardware features	Tells what rooms are completed, Twitter's and some calls	Small antenna wireless Ambos can make a mobile hotspot
Antenna		
Satellite		
Software features		Calls broken up by fun dept, what kind call
Data entry system		
Usability	Design features online website	Timely in chron order • Phone button to say what's going on

handwritten notes at bottom:

✗ spray it Gas ✗ Roller on mouse can ✗ more in fire, ambo, hazmat
✗ Driver's logs mess up hospital log ✗ as long book still written out
✗ fast engine ✗ fire and fire separate
software
Fire super slow

In-Depth Observation Table

Framework Bullets	Technology/User Role	Observation—Needs, Barriers, Facilitators, Training etc.
Theoretical Features		
Rogers Diffusion of Innovation	Reliability Late Majority Early Majority	Reliability – The department as a whole is reliable the city and county of Salisbury Managers and employees rely on one another in case of emergency as well as day-to-day jobs. Late Majority – one of the last counties to connect to Maryland EMT system Early Majority – Generators keep power on if power failure
Garbage Can Model	People Choices	Garbage can model is used everyday when working along side people everyday like those in the SU fire department Firehouse dinner – group decision about dinner About who goes on what call
Media Richness	Computers IPhones People	Each chief is given a cell phone as well as a duty phone There are computers all over the fire house and a special office area where employees typically gather and do online research Barriers – computer training optional Not everyone has access to iPhone
Impression Management	People – Employers and customers	Observation – Overall good impression management's skills amongst employees. Dress code Barriers – Not everyone remembers the training when dealing with people
Technological Features		
Hardware features		
	Antenna	On cars and trucks tpically to improve connection between cars as well as radio
	Satellite	Satellite computer systems connecting all computers between EMS/FD/PD
Software features		

Time Observed	Who is Involved	Technologies Involved	Observations	Questions
1:40	Ass. Chief	I-Phone Chief	Very informative can tell all the other chiefs when they are available	
1:45	Ass. Chief "Live-in" Phone tapping Security	hooks Pointer that Prints out the Call	is there an Alarm hooked up?	Is it hooked up to the CAD.
1:50	"Live-in" Ass Chief	Base Radio	Old - its for Snow Storms hurricanes	Is it their Command Center? Yes When they have big storms
1:55	Security	Controls the hardware	Controls the TV's, the Alarms	
2:00		fit test Machine	its for their masks and makes Sure they are safe to use	
2:11		heart monitors	Can communicate with the Hospital	

Time Observed	Who is Involved	Technologies Involved	Observations	Questions
1:00	Chief of the Salisbury Fire Department	Television with all the 911 calls in the city of Salisbury	Giant map of the city of Salisbury with some of Fruitland with a quota system	Asked what all the different colors on the map and radar meant
1:05	Chief of the Salisbury Fire Department	Assistant Chief SUV vehicle	Checking out all the equipment and battery it takes to power the vehicle	Asked how many batteries it takes to power the vehicle
1:20	Chief of the Fire Department	Car Computer	I observed that the computers being used are still sing an out of date Windows system	I asked why not upgrade the system
1:30	Asst. Fire Chief	Exhaust System	I observed the many ventilation systems that the fire house used to extract the carbon dioxide out of the fire house	I asked if anything bad has ever happened if not functioning properly
1:45	Volunteer Firemen	Google Map Systems	Shows the best way to travel to the incident they are going after	I asked if they ever have any glitches with the system
1:50	Asst. Fire Chief	Dive Unit	They have an ambulance style vehicle full of all of the dive equipment used for the dive team	I asked the price of all the gear
2:00	Asst. Fire Chief	Washing Method	Industrial sized washer and dryer that the firemen use to clean their gear to get all carcigens off their gear	I asked them how many times a week they would regularly clean their gear

Transcribed Interview

Michael McLean

Mellissa: What kind of technology is new at your fire house?

Asst. Fire Chief: Pushing 8 years old now it was state of the art at the beginning. Coming from

1920 station to a new station in 2006. We have Wi-Fi internet use; everything is via email and

texting. We also use high end radio systems to communicate from vehicle to vehicle. County is

going to new system in the next four to five years. It will cost hundreds of thousands of dollars.

business

Tax payers will have to pay for it if they don't have the due funding through the state and

federal level. It's not a matter of what it's when the technology will be available. All the

communicating is through emailing and texting to visit other stations in Salisbury. There are

four shifts with different duty shifts and then we're off for 72 hours, we are all the same people

supporting

just different duties. A lot of volunteers if they are up to date with information.

Mellissa: What new communication systems will come into play in the future?

Asst. Fire Chief: New radios, new radio signals, and new radio towers will come into play while

the new system upgrade happens. Labor and parts costs change daily from expenses to get IT

staff to utilize the upgraded system.

Mellissa: What is the most technological tool that is used?

Asst. Fire Chief: Each piece of technology is utilized the most in the firehouse. Such as the fire

house app that the chiefs can schedule events and work schedules. We also use Facebook,

twitter, and Instagram to reach out to the public who are our stakeholders. If we have special

events, big accidents, or road issues we put them out so the public can see what is happening. We need the ability to work in a clear and risk free environment to work in with the public on our side. Also we are trying to reach out to the local public information coordinator to help grow awareness with the station.

Mellissa: Who keeps track of the Social Media sites?

Asst. Fire Chief: The chief under me usually follows behind me and takes over. Usually it is the captains who take it under control. This is done because we don't want anyone to post anything bad or vulgar on the sites to make the department look bad. The 911 center can send out notes with the calls so they don't have to put it over the scanner radio. You always have to leery on what you say over the radio scanner. Other sites can be used to show equipment maintaince and trying to get on the cloud with the fire department firewall. The city needs a better firewall to serve the cloud.

Mellissa: Besides the fire house app what other software and programs do you guys use?

Asst. Fire Chief: We utilize chief backstage where we maintain our scheduling and a way to keep track of the career times. When it looks like a bag of skittles it is a different fire code. Such as volunteers levels can be high to show how much they are working. They can also submit overtime, comp time, and time off through the app. You can also switch shifts through the app to manage how many shifts are open or close. Also, we can text certain people or all the members through this app. We can also do press releases and public service announcements off this app. There might be upcoming events and temperature outside is on their website.

Mellissa: How do you like the technology now?

Asst. Fire Chief: When my cell phone doesn't work it gets pissed off, they can keep i-phones I went back to a galaxy phone and so far I love it. It works well when it works but when it doesn't work its very hard to go back in reverse. Our EMS reports are done electronically it goes into a tablet which is called a tough book. 9000 calls a year for EMS with 3000 of fire which is about 12000 calls a year. It used to be a bubble sheet to fill in for calls but now the tablets can give you hints for information to put in to the system. It is very hard to go back to pen and paper because they can't get their reports done if their tablet computer is misshaping. E-mails not sending are a daily problem in the fire house.

Mellissa: What do you think would be a beneficial technology that would make the fire station better?

Asst. Fire Chief: The 911 center doesn't utilize the technology at hand to the fullest extent of its ability. We are in the process of making a box alarm system, which gets the closest unit available to the right house call. Such as, we need a specific number of people to go to each type of event and the box alarm system will reach out to those people to get the right number there. If one isn't available to go to a call it will jump to the next firehouse to make sure it is in place. We have to let fireman try to work with stations from people from other stations not wanting other fireman in their area. We don't utilize this system even though it is ready to be used at any time.

Mellissa: How could a dispatcher be good or bad?

Asst. Fire Chief: Thinking ahead, the way they speak, and how they take the call at hand. If they need a higher value of need, the dispatcher should allow the different calls to divert a lesser call to go to higher risk call. Some of the dispatchers are outstanding people and deserve more money for the work that they do. You just have to be politically neutral. The dispatchers can be in call for the whole call run but it's mainly off their handheld units.

Moses Edwards: Volunteer EMR

Kelly Stottlemyer : Volunteer Firefighter EMT

Q: How does the station use technology to enhance the work that is done at the station as volunteer:

A: Stottlemyer- All the scheduling is done online, the officers will place there people in whatever position, there are 3 stations in Salisbury, but during the week there are five different apparatus, that also where volunteer can be requested to be added, in each piece of apparatus there is an MDT: mobile data terminal, which on that show where all the calls are coming from, and if it's a fire, on call, or on service. When the dispatcher calls in shows us where we're going, who we're going to, and other things we need for our reports. Our reports are done online on a system on the computer, we have radios to talk to each other with different channels based on the call, if you're on fire or ems or an incident where we need to switch to a channel that way it's not being interrupted by other fire and EMS calls.

Edwards: We have a computer monitor out there, if a call is incoming you see an arrow where the areas at or a box of the call, from police to other apparatus. It will show where we are at the city if its north, pagers, if we're at home and the pager goes off will come back to get hop on a fire engine. It's whenever we are always on call.

Q: What the most important technological tool that you guys use as volunteers?

A: Stottlemyer- For volunteers its probably be the pagers or the texting system, because if were not in station we would not here the alerts go out.

Q: How do you uses technology to connect to the Salisbury community?

A: Stottlemyer: We have a website,

Edwards: everything is on the website, from press releases, fire safety data, to hyperthermia memos, to pictures, open houses and stuff like that. We have a Facebook, when we have structural fries those usually go on there,

Stottkemyer- events fundraising, we've had family donate smoke dictator and business?

Q: Do You find the Facebook page and Website useful?

Stottlemeyer: I like it?

Lexi: But you didn't look at it, so what can make you want to look at it

Edwards/Stottlemeyer: its dull its been like that since 08.

Lexi: more for the community

Edwards/stottlemeyer: definitely for it to be updated,

Lexi: So you don't go on the Instagram or twitter

Edwards/stottlemeyer: I like the twitter

Q: how do you like the technology at the firehouse right now ?

Edwards: it has improve, especially the system in the engine bay

Lexi: when did they update it?

All- Just a few months ago actually.

Stottlemeyer: they updated it someone finally fixed it the call and time was wrong, the screen that's in the kitchen is really great cause everyone comes here for dinner and we just sit in the kitchen and stand and stare at the monitor. The different tones is nice, it's a different for everyone. Its call the all call it calls all three Salisbury stations, its different due to the different tones.

What do you think can be beneficial technology to help the fire station?

Stottlemeyer- the apparatus and the computers.

Q: would it be talking to other firefighters or getting calls in?

Edwards/Stottlemeyer- its hard cause we have everything, we are really spoiled.

Q: haven't had any problems, or I wish this technology was here?

Edwarss/Stottlemeyer: just more radios

Q: so you all think the technology here is good you just need more connection with the community

A: All- yes: Stottlemeyer- it's a bit of a struggle, and getting people excited and recruiting for volunteer, getting people excited for helping and staying.

Q: what would you change about the technology?

A: All- just the website and the way we connect with the community, not just different outlets but different ways and actually using them to comment with the community.

Q: do you think there are any improvements/ any glitches:

A: in one of the ambulances there is a computer that switches off and on

Technology: Field Research

5 Foundational/backbone technologies being used at your organization:

1. Radio System
2. GPS System (the TV's) CAN LOG -Computer aided dispatch log
3. Mobile Data terminals (MDT)
4. Computers
5. Alarm System

Technology 1

Features of technology:

Technology	Features	User Skills Required	User Challenges/Facilitators
Radio System	Utility	Having the ability to promote safety and enhance radio's to work together more effectively.	Training the Fire Department on how to promote safety first is always a challenge.
	Feasibility	Effective equipment maintenance and handling.	A user challenge would be if a firefighter was careless and lost their portable radio inside a fire.
	Mutual assistance	Knowledge on programming on how to connect the automatic aid agreements with local, state, and federal agencies.	The user challenge is working with the local, state,and, federal agencies to connect the Fire systems with them.

Market analysis

Technology	Price/Features	2 Major Competing Models	Price Features
Radio System	Price: $382/1	Vertex VX-451	Price: $219.95/1

Motorola Yellow APX XE Microphone with Extreme Temperature Cable		Two-Way Radio	
	Total of radios: 20 Multiply by $382 Total Cost of: $7640		Total of radios: 20 Multiply by $219.95 Total Cost of: $4399 Features: Maximizes worker uptime with expanded safety applications for heavy duty use. Emergency button sends a signal out that there is help needed.
	Features: First accessory with dual microphone noise suppression. Has a strobe light that activates when the emergency button is pressed, casting light up in 10 feet of thick smoke.	Motorola RDX RDU 2020 Two-Way Radio	Price: $459 Multiply $459 By total radios: 20 Total Cost of: $9180

Competing Model 1

Model 1	Features	Pro Features (Organizational benefits, User fit)	Cons—Features (Costs, User training/fit, challenges)
Motorola RDX RDU2020 Two-Way Radio	2 channel radio	More of a secure connection between the people in the radio connection.	Only 2 channels are available for communication.

	Li-ion battery life	High energy density and does not need prolonged priming when new.	Requires protection circuit to maintain voltage and current within safe limits and is subject to aging, even if not in use.
	Full complement of accessories to work with	Allows the fire department to have all the necessary and high tech accessories to make their jobs more easy and effective.	The only con I see in this is the cost of all the accessories especially when the radio is already the highest cost of the ones reviewed.

Competing Model 2

Model 1	Features	Pro Features (Organizational benefits, User fit)	Cons—Features (Costs, User training/fit, challenges)
Vertex VX-451 Two-Way Radio	Has 32 channels available for use.	Multiple channels allows different radio frequencies for different people.	Civilians may also have access to the 32 different channels the radio and department may use.
	Vertex Standard	To do more for less to effectively meet the needs the customers around the world.	This radio is not fireproof up to the high temperatures that may be present in a house fire.
	Emergency Notification system	With a press of a button the radio switches to a designated channel and sends an alert for help.	Has no strobe light present in case of a heavy smoke situation.

Technology 2

Features of technology:

Technology	Features	User Skills Required	User Challenges/Facilitators
GPS System (the TV's) CAN LOG -Computer aided dispatch log	Integrated Computer Aided Dispatch System	Other than installing the only user skill required is knowing what each symbol means on the map and system.	Learning the many symbols in the program to know exactly what the incoming call is for.
	Efficient Response	Good driving skills are important with this because the system gives the quickest route to get to the scene.	The main challenge is knowing the roads in the area that you are working in the operator doesn't have to solely rely on the GPS.
	Interactive Mapping	Knowing what unit to dispatch to call directly by dragging and dropping the appropriate icons and symbols on the map of the area.	Educating the department on what and where to drop different units to dispatch to the area.

Market analysis

Technology	Price/Features	2 Major Competing Models	Price Features
GPS System (the TV's) CAN LOG -Computer aided dispatch log	2 Million Dollars for the whole system throughout the different types of departments in the county.	TriTech software systems	2.5 Million Dollars. Some features are streamlined call-taking and dispatching to improve response times to capture all major data points throughout each call.

			Another Feature is a flexible, patient-based scheduled call taking to efficiently manage transports.
	Features: One feature is customizable dispatcher software that allows the option of working with a computer mouse or keyboard.	New World Systems	Price: 1.5 Million Dollars. Some features are decreased response times by giving rip and run reports instantly. Another feature is increasing first responder safety by giving potential hazards and warrants so the responder is ready for what they are going in for.
	Another feature is the NG9-1-1 Compliant CAD which is being developed to give dispatchers the ability to receive, send, and archive text messages, videos, photos, and other forms of data.		

Competing Model 1

Model 1	Features	Pro Features (Organizational benefits, User fit)	Cons—Features (Costs, User training/fit, challenges)
TriTech Software Systems	Streamlined call-taking and dispatching to improve response times.	Respond CAD captures all major data points throughout each call to capture pertinent information and dispatch resources quickly.	The con would be training personnel on how the integrated mapping and seamless integration works within the system and software.
	Flexible, patient-based scheduled call taking to efficiently manage transports.	Response CAD's scheduled call taking capabilities allow EMS agencies to efficiently manage transports and resources.	The con is training personnel to when and where to schedule the calls in the system and software.
	Timings and warnings for response time compliance and system status management.	Response CAD features numerous timing and warnings configurations.	The con in this is only system administrators can configure timings, warnings, facility colors, and timestamps throughout the Respond CAD system.

Competing Model 2

Model 1	Features	Pro Features (Organizational benefits, User fit)	Cons—Features (Costs, User training/fit, challenges)
New World	Decrease response	Advanced features include	The con is that the

Systems	times.	automatic address verification, real-time GPS unit locations, dynamic unit recommendations, and rip and run reports.	first responder/s have to make critical decisions quickly to reduce times significantly.
	Increase first responder safety.	By providing instantaneous information such as preplans, hazards, wants, and warrants to dispatchers and field personnel.	The con is knowing that you are arriving to someone's house that may be dangerous to themselves on to the first responder personnel.
	Add location information and advanced mapping.	The CAD maps provide valuable information that improves tactical analysis and enhanced situational awareness and preparation.	The con in this is being able to provide a big enough computer monitor or television to show the map for the department.

Technology 3

Features of technology:

Technology Mobile Data terminal / mobile digital computer	Features GPS Functions	User Skills Required	User Challenges/Facilitators
	Two way computer	Basic computer skills	Limited service

	screens Connects EMT's		sometimes
	Connects with central dispatch office		
	USBPort		

Market analysis

Technology	Price/Features	2 Major Competing Models	Price Features
	Markets for about $2,000-8,000	MDTs may be tablet convertible	$1,500-2,000
		Serial port to connect to a satellite or terrestrial radio transceiver.	

Competing Model 1

Model 1	Features	Pro Features (Organizational benefits, User fit)	Cons—Features (Costs, User training/fit, challenges)
	Drop tested and rated. Sealed against dust and liquid.	Very durable, and easy to transfer back and forth.	No cloud system,

		Easy for them to document information	Overly expensive

Competing Model 2

Model 1	Features	Pro Features (Organizational benefits, User fit)	Cons—Features (Costs, User training/fit, challenges)
Mobile data terminals are often used in conjunction with a "black box" that contains GPS receiver, cell phone transceiver, other radio devices, or interfaces to industry-specific equipment. AVL devices may be simple stand-alone modems or may include operating systems with application space for the system integrator.	GPS	This is only a need for one technological based program to run all these functions, one does not need to carry a radio,gps system, phone, the computers have all of these components.	As mentioned before, the cost is extremely expensive
	Phone	CAD system	
	Radio device all in one	They uses EMEDS - * The Expeditionary Medical Support System (EMEDS) is a modular field hospital system developed by the U.S. military for mobile deployment of medical	

Technology 4

Features of technology:

Technology	Features	User Skills Required	User Challenges/Facilitators
Windows Computer	Keyboard,keypad, mousepad, Desktop	Basic computer skills	Limited space on hard drive
	Internet/WiFi capable		Requires constant updates
	USB Ports		No cloud

Market analysis

Technology	Price/Features	2 Major Competing Models	Price Features
Windows Computer	300-500	Mac Desktop	1,300-2,000$ iCloud,camera, more memory
		Windows laptops	200-600

Competing Model 1

Model 1	Features	Pro Features (Organizational benefits, User fit)	Cons—Features (Costs, User training/fit, challenges)
Mac Desktop	Camera, mouse, keyboard, High resolution screen	Long lasting	Some programs require training

	USB Ports HDMI Port	Easy to save data, handicap features	Costly
	iCloud,WiFi/ internet compatible	Easy to connect with others instantly	

Competing Model 2

Model 1	Features	Pro Features (Organizational benefits, User fit)	Cons—Features (Costs, User training/fit, challenges)
Windows laptops	Camera, Wifi accessible	Easy to use, does not require much training	Does not last long
	USB Port HDMI Port	Handicap features	No Cloud
	Some have touch screens		Requires constant updates

Technology 5

Features of technology:

Technology	Features	User Skills Required	User Challenges/Facilitators
Alarm System	Alerting which crew is needed on the scene.	Good Listening.	If someone has bad hearing, they wouldn't be able to hear the alarm.

	Different Decibel Tones.	Knowledge of what tone goes with which crew.	Teaching the Firefighters and EMT's the tones.
	Efficient.		

Market analysis

Technology	Price/Features	2 Major Competing Models	Price Features
Alarm Systems or personalized pagers		**Swissphone RE629 pager**	$414
		Teletics WKSU	$5-$10 a month with MoTech and cellular

Competing Model 1

Model 1	Features	Pro Features (Organizational benefits, User fit)	Cons—Features (Costs, User training/fit, challenges)
ComTech	Count Up/Down Timer On Site Configuration And Adjustments Non Proprietary Hardware Strobe Lighting	One Year Factory Warranty Fire Alerting Controller (FAC)	Updating the crew with the new technology and tones.

Competing Model 2

Model 1	Features	Pro Features (Organizational benefits, User fit)	Cons—Features (Costs, User training/fit, challenges)
Swissphone RE629 pager	Compact Size	Impressive battery life	External control knob
	BlackLit LDS Display	PSW629 software	
	Durable Case		