

Evaluating The Brigantine Fire Department and Emergency Medical Service

Information Technology Utilization

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Abstract

The Brigantine Fire Department & Emergency Medical Service (BFD&EMS) uses information technology in the department to support workflow and training. The purpose of this research is to investigate and clarify the current status of utilization of information technology within the BFD&EMS. Surveys of employees, a literature review, and analysis of computer software log in data was used to gain information on the status.

Descriptive research was used to answer the following questions. (a) Who is affected by inadequate use of information technology in the BFD? (b) What are the information technology needs of the Brigantine Fire Department? (c) When can information technology be applied to increase efficiency or effectiveness? (d) Where within the BFD&EMS can information technology applications be engaged? (e) Why / Why Not are BFD Employees utilizing IT to their advantage?

The research indicated that the department had problems with employee's not complying with the operating guideline for information technology. The employees were aware of the technology assets available at work. The literature review revealed possible explanation for employee behavior about information technology.

The recommendations are; Raise employee compliance with IT guidelines; Investigate the possibility of allowing employees to use personally owned mobile devices to accomplish department work flow; investigate further the use of web based applications; Plan and implement a geographic information system.

Introduction

The fact that technology is pervasive has become a cliché. Most of us take for granted that sophisticated, rapidly changing technology is the foundation for a vast variety of products and services we depend on, from integrated circuits in automobile brakes to financial models for managing pension funds. Although technology is everywhere, its development and application are still fraught with problems.”(Iansiti, 1998, p. 7)

The problem is that the Brigantine Fire Department and Emergency Medical Service (BFD&EMS) may not be utilizing information technology adequately. Inadequate utilization of information technology within the Brigantine fire department could lead to negative consequences for the department, employees, and the community the department serves.

The purpose of this Applied Research Project (ARP) is to investigate and clarify the status of the utilization of information technology in the BFD&EMS. For this ARP, the descriptive research method was used. To further concentrate the area of the research, the following research questions were used: (a) Who is affected by inadequate use of information technology in the BFD? (b) What are the information technology needs of the Brigantine Fire Department? (c) When can information technology be applied to increase efficiency or effectiveness? (d) Where within the BFD&EMS can information technology applications be engaged? (e) Why / Why Not are BFD Employees utilizing IT to their advantage?

Background & Significance:

The City of Brigantine is a barrier island located on the East coast of the United States, in southern New Jersey. It is a suburb of Atlantic City New Jersey. The island according to the 2010 census had a total area of 10.364 square miles (26.844 km²), of which, 6.387 square miles (16.543 km²) of it is land and 3.977 square miles (10.301 km²) of it (38.37%) is water. Brigantine is also known as Brigantine Beach Island. There is only one road to and from Brigantine, New Jersey Route 87, locally known as Brigantine Boulevard. (http://en.wikipedia.org/wiki/Brigantine,_New_Jersey).

Census data shows the community has 9451 year round residents. The estimated transient, summer, population is 20, 288 persons. This is calculated by using census data to calculate housing units multiplied by 2.2 persons per unit. Anecdotal evidence, such as “drinking water use, indicates the transient summer population is possibly greater than 35,000 persons. The actual developed area of the island is 3.03 square miles”.(E. Stinson, Brigantine City Engineer, personal communication, August 24, 2012). Using census data for calculations; the population density of the developed areas is approximately 3119 residents per square mile. The residential unit density is 3043units per developed square mile (http://en.wikipedia.org/wiki/Brigantine,_New_Jersey).

The Brigantine Fire Department and Emergency Medical Services (BFD&EMS) is a career department. The department has one station. The department has 35 full-time sworn employees and 3 administrative assistants. All sworn personnel are certified as both Firefighters and Emergency Medical Technicians. Dual certification is a condition of employment. There are 4 platoons that work 24-hour on duty shifts with 72 hours off

duty between shifts. The department provides fire suppression, rescue service, emergency medical service, and fire prevention services to the community.

The department currently utilizes a paper posting and bulletin board system for communicating important departmental orders, memorandums and information. The paper system may not facilitate information sharing among other departments within the City. The paper system may make compliance with orders and policy memos slow. The paper system may prevent the timely communication of critical information from agencies outside the city i.e. State or Federal Emergency Management. The use of e-mail and electronic data systems to provide situational awareness may not be effective.

Traditions die hard in the fire service but it is not clear the reason for continual use of the paper system. A simple lack of understanding; or anxiety caused by the lack of understanding, could be the reason for not embracing information technology. When it comes to technology “technical experts and members of the general public appear to define risk and acceptability of technology in fundamentally different ways. These differences are likely to contribute to miscommunication and controversy”(Gould et al., 1988, p. 51)

The department provides 6 computer workstations and Wi-Fi access within the station for performing tasks related to information technology such as e-mail and data entry requirements of the department. The department utilizes Fire House Software© to manage data. The data recorded is about completion of: emergency responses, station duties, vehicle maintenance, staffing, fire prevention, and training. Communication & information software is available on all workstations.

The department computers have available Microsoft Outlook© software, Microsoft Internet Explorer© and an exchange server network for e-mail and information sharing. In spite of the available information technology resources, the department is using paper to communicate and share information.

The department has standard operating guidelines in place to provide guidance and expectations on use of computer systems during tours of duty. Department standard operating guidelines require that employees log in to a computer workstation every workday to complete data entry items and check their e-mail (*BFD/SOG 100.4*, 2008, p. 2). The department also has policies in place for personal web pages, personal web sites, personal electronic networking, personal cell phones, cell phone camera's, and internet use while on duty (*BFD SOG 400.3*, 2012, p. 2). These guideline are in place to assure the appropriate use and application of information technology.

This research project is significant to two of the United States Fire Administrations strategic goals. It is significant to Brigantine Fire Department and Emergency Medical Service for the same two reasons. First, by improving local planning and preparedness by expanding the use of modern data and information analysis in planning and preparedness. Second, by improving the fire emergency services capability for response to and recovery from all hazards by promoting effective data exchange and information sharing.

Literature Review

“The most precious non-human asset a fire company or department has is information” (Furey, 2012, p. 6).

The literature review was conducted focusing on the five research questions as guidance for what to investigate. The review began with three current editions of fire service textbooks. These books were chosen because of their relevance for chief officers, management in the fire service, and the impact their publishing organizations have on the fire service. A common theme within each of the text was not what information they provided, but what was lacking. Only one text reviewed provided depth about the importance of information technology and its relevance to workflow.

“This is the information age. In no time in history has so much raw data, covering virtually every facet of life, been available to the average person. Acquiring data is not difficult. The problem is determining how it can be used. The term “office” implies a place where data is available and can be transformed into information. The Fire Department office serves as a “central nervous system” for information. Station and/or maintenance facility personnel or the fire inspector may be the end user of information, but generally the office helps facilitate information processing. Virtually every service provided by the modern fire department has a qualified body of knowledge.”(Coleman et al., 2003, p. 30).

The two other books, a National Fire Protection Administration (NFPA) book titled “Management In The Fire Service” (Carter, 2008), and an International Fire Service Training Association (IFSTA) book titled “Chief Officer” (Adams & Stowe 2004.), offered little guidance on application or use of information technology.

They did acknowledge that “New technology is continually being developed to assist in the complex administration of the fire and emergency services and training of our most valuable resource; are department organizations employees. Chief officers must be aware of the products and programs that will have a positive effect on the operation of their organizations. These products include computer hardware, computer software, communication equipment, and office equipment”(Adams & Stowell, 2004, p. 348). The acknowledgement was not reinforced with details on applying information technology to the fire service.

An important component of information technology is people. Information is managed, interpreted, and used by people. If we consider people, we must consider behavior and attitude towards technology. Popper et al noted that people “did not view technology as a commodity but rather a functionality that fits within a larger process” (Popper et al., 1998, p. 38)

Successful application of technology is dependent on the motivation of the people who will use it and benefit from it. “At the start of the past century a German expert on agrarian economics put forth a bold argument about the dynamism of modern business. The enormous progress embodied in the industrial revolution, he argued, could not be explained simply as a technological feat. Entrepreneurs and the people who worked for them also needed to be motivated”(Wuthnow, 2010, p. 205).

The literature review indicates that it is important that employees embrace information technology and realize “that a central obstacle to the effective management of technology is knowing when and how to break with the past. This judgment involves balancing the efficiency of routinization against the dangers of the associated organizational inertia” (Iansiti, 1998, p. 144).

The literature was not abundant with specific information technology needs for a fire department. There was information available in reference to technology and its importance to all industries. “The most important of the technologies are software, microelectronic and telecommunications, advanced manufacturing technologies, materials, and sensor and imaging technologies” (Popper et al., 1998, p. 18).

The literature indicates that a fire department may be inefficient or ineffective if it is not using, IT to its advantage.

“As populations and building development increase, the role of the fire service becomes more demanding and complex. As never before, fire departments are being called upon to deliver services with greater efficiency and economy. Citizen tax-reduction initiatives, burgeoning needs for different kinds of local government services, and a host of other factors have brought new demands to the desks of fire chiefs—most notably, the demands to "do more with less" and to do it "better, faster, and cheaper."(*ESR White Paper*, 2006, p. 5). The relevance to the fire service is that information technology allows workflow to be accomplished better, faster, and cheaper.

The literature indicates that IT has a place within emergency responses. “Crisis can be regarded as “information poor” situations. A typical crisis situation requires large amounts of information because initially little is known”. There is pressure on the crisis team to acquire and process information quickly and accurately if it is to operate effectively in a crisis...crisis managers must examine and interpret the raw data”(Coombs, 1999, p. 99)

A current information technology topic relevant to the fire service is geographic information systems (GIS). “GIS is a computer-based technology that links geographic information (where things are) with descriptive information (what things are like). GIS is used to capture, display, and analyze data spatially. GIS combines layers of information about a place

to give users a better understanding of that place” (*ESR White Paper*, 2006, p. 2). This type of information system has applications in the fire service. An example would be preplanning and response information. GIS could assist a responding fire company by providing a three dimensional picture of the neighborhood, hydrant locations and even building details, to a tablet computer while responding to a call.

Information technology is critical to the fire service since the 2011 terrorists attacks. Thesis papers have been written “to assist local fire departments in building information systems and training personnel in open source intelligence”(Robson, 2009, p. v).

Information technologies are necessary to the fire service especially when integrating intelligence information into operations. Military papers describe the use of “touch- screen computers with software designed and installed to allow for managing resources on the scene of a fire or emergency and also have the capacity through a secure wireless network to receive information from multiple sources in real time during a fire or emergency” (Richardson, 2010, p. 79).

Information technology systems using commercially available software and hardware can be applied to the fire service. The military is using IT in situations that have direct applications for the fire service. In the January 2011 issue of the military Journal C4ISR (command, control, communications, computers, information, surveillance, reconnaissance) the cover story is about applying personnel and equipment tracking software to a commercially available smart phone(Werner, 2011, p. 18). The system can be applied to fire ground accountability.

The question of why or why not IT is being properly utilized is important. The literature provides much information on this topic. There may be a lack of understanding of the importance of information sharing. “IT is an internal service operation. The customers of IT are other city

departments rather than citizens. Those customers become increasingly reliant on a variety of automated systems for conducting their operations, they come to expect quick and reliable service and become increasingly impatient when speed and reliability are absent”(Ammons, 2012, p. 192).

There may be a attitude that IT will replace some economic interest of the firefighters such as attending training classes; rather than a useful capability. “Industry respondents indicated that the ultimate referent for a critical technology is economics-and no other metric. Technology is viewed as either a cost-reducing mechanism within a larger business process or a means of providing advantage by conferring new capabilities and functionality”(Popper et al., 1998, p. 128).

The literature indicates that employees may not understand the risk benefit of IT use because they must involuntarily comply with using information technology. “Society tolerates greater risk from technologies that provide greater benefits (more specifically, risks are acceptable in proportion to the third power of benefits) and that risks from voluntary technologies are approximately 1000 times more acceptable than risk from involuntary technology” (Gould et al., 1988, p. 49).

It is possible that firefighters do not understand the critical nature of information technology. “As the focus on sources of military advantage had shifted to more technical realms, certain technologies have come to be identified as “critical”. In the same sense beginning in the 1980’s the term “critical technology” began being applied to the civilian arena as well” (Popper, Wagner, & Larson, 1998, p. 1).

The time is ripe for advancing the integration and use of information technology into the fire service. “Signed into law in February 22 [2012], the Spectrum Act gives public safety the means by which to construct a nationwide public safety broadband network. This will bring public-safety communications into the 21st century, getting firefighters, EMS responders and law enforcement officers the same capability enjoyed today by many citizens who use cellular mobile devices. Public safety, as the single license holder, will control the network”(Caldwell, 2012, p. 1).

In an effort to investigate what is normal information technology availability, 2010 census data was examined. New Jersey census data reports “80.6 percent of individuals, 3 years and older, live in a household with internet access”. The data further reports that 40.8 percent of individuals, 3 years and older have access to the internet from some location outside of home” (US Census Bureau, 2010).

Procedures

This applied research project was initiated by electronic database searches at the National Emergency Training Center (NETC) Learning Resource Center in Maryland and the Richard Stockton College of New Jersey. Databases at the aforementioned libraries were searched for resource material that contained the words “information technology,” “fire service technology”, “computers”, and “emergency management”. An Internet search was initiated using the same terminology. Resource materials were identified, retrieved, downloaded and reproduced as permitted. Relevant applied research projects were also downloaded from <http://www.lrc.fema.gov/efop.html>. In addition, materials were obtained from the Brigantine Fire Department resource library. All of the research for this project was conducted between March and September 2012. Once the research materials were accumulated, the process of

reading and reviewing the materials was undertaken.

Regarding the problem and purpose of the research, a survey was developed. The intent, relevancy, accuracy, sequence, and layout of the questions within the survey were developed to provide credibility to the research data and to the project. The focus of the survey was to:

1. Accumulate some statistical data about the respondents.
2. Identify what the respondent's knowledge of available IT resources was within the department.
3. Identify the respondent's utilization of available IT resources within the department.
4. Identify what the respondent's knowledge of IT resources available to them was outside the department.
5. Identify what the respondent's utilization of available IT resources was outside the department
6. Identify the respondents' attitudes towards IT resources.
7. Identify the respondent's use of mobile information technology.

The survey was given to all 35 Firefighter Emergency Medical Technicians of the BFD&EMS. The entire department was included in the survey because they are the target population of the research project. The respondents were given two weeks during August 2012 to reply. The departmental notification of the need to complete the survey was posted on the department bulletin board as well as e-mail notification. Each notification source listed an on line link (short cut) to the survey. The survey was anonymous and did not require a log in to get on to the web site.

Additionally regarding the problem and purpose of this project, software login activity,

and e-mail activity was examined. The software login data was accumulated via software query using Fire House Software©. The query of the 35 members was set up to identify: user, workstation name, login date and time, logout date and time, and total time spent logged in to the workstation. The date range was for a three-month period between March and June of 2012. Analysis of the data was then carried out.

Data was accumulated from the e-mail activity of the Microsoft Outlook © system. E-mail communications requiring action on the part of the firefighter were sent out.

In the month of April 2012 e-mail, here identified as e-mail number 1 (E#1), regarding terrorist activity was sent to all 35 members with high importance. The relevance of this e-mail was that it contained information of high importance regarding actual terrorist activity and was need-to-know information related to daily operations. No other system of notification was used to inform the recipients that the information existed.

In the month of May 2012 another e-mail, here identified as e-mail number 2 (E#2) was sent requiring all 35 members of the department to set up a network account with the National Fire Academy. The recipient's actions in processing the e-mails were analyzed. The relevance of this e-mail was that it required the recipient to act on it and carry out a direct order sent via e-mail. The departmental notification of the need to complete the account set up was posted on the department bulletin board as well as e-mail notification.

The limitations to the study were that the research was confined to a small group within the BFD&EMS. As such a small sample was being used, compliance with data gathering was anticipated to be 100 percent. There were no known conditions that would prevent 100% compliance.

Results

The evaluation period for the research was between March 28th 2012 and June 26 2012. During that period the platoons worked an average 22.75 days. This gave members 546 hours to respond to the survey and allow their computer use to be analyzed.

The completed, anonymous, individual surveys provided the data listed here.

Ninety one percent (91%) of personnel responded to this survey, which represents 32 of 35 expected responses. The age range for the respondents was between 18 and 60 years of age. Seventy five percent (75%) of the recipients were 50 years of age or younger.

One hundred percent (100%) of the respondents were aware that they had the following:

1. An employer provided computer workstation available.
2. A work e-mail account available.
3. Internet access at the fire department.
4. The department uses national fire incident reporting system software.
5. The department uses computers for training personnel.
6. The fire department has a department sponsored internet web page.
7. Expressed positive opinion that computers do have an application or use in the fire service/department.
8. Expressed positive opinion that in the next 10 years computer technology will play a larger role in the fire service/department.

Ninety three point eight percent (93.8%) of the respondents were aware that they had access to wireless fidelity (Wi-Fi) within the fire station. Of the respondents 25% believed that the Wi-Fi was for departmentally owned devices only. Seventy-five percent (75%) used the Wi-Fi for access to the internet via a personally owned mobile device or portable computer.

Fifty percent (50%) of respondents reported that they use the station Wi-Fi access every day at work. 6.3% reported accessing the Wi-Fi every other day at work. 3% reported using the Wi-Fi once a month. One percent (1%) reported using the Wi-Fi every other month.

As for specific types of software used only 77% knew the name or type of software the department was using to support fire operations. Sixty-eight percent (68%) of the respondents knew the name or type of software used to support emergency medical service operations

Utilization of the available IT showed that 87.5% of the department members reported to check their work e-mail every day they worked. Six point three percent (6.3%) responded that they check their work e-mail account every other day. Three point one percent (3.1%) report to check their email every third working day. Three point one percent (3.1%) reported to check their e-mail once a month.

Evaluating home e-mail access, 93.8% of the respondents reported they did have access to home e-mail. Six point three percent reported they did not have home email access.

Utilization of available IT at home showed that 59.4% of the respondents checked their home e-mail daily. Nine point four percent (9.4%) checked their home e-mail every other day. Six point three percent (6.3%) reported checking their home e-mail three times a week. Nine point for percent (9.4%) check their home e-mail twice a week. Nine point four percent (9.4%) checked their home e-mail once a week. Six point three (6.3%) reported to never check is their home e-mail.

Seventy one point nine percent (71.9%) of respondents reported they access the Internet every day at work. Eighteen point eight percent (18.8%) responded that they access the Internet at work every other day. Nine point four percent (9.4%) responded that they access the Internet once a month at work.

Ninety three point eight percent (93.8%) of respondents reported that they were aware there was software for managing and tracking station duties. Six point three percent (6.3%) reported they were unaware of software for tracking station duties.

Ninety point six percent (90.6%) responded that both instructors led and individual training used computers for training.

Seventy five percent (75 %) of the department use and own a smartphone, tablet device, or both.

Fifty six point three percent (56.3%) of the respondents reported that they had a fire department related application on their personally owned mobile device.

Sixty five point five percent (65.5%) of respondents reported that they would be willing to use their personal smartphone to conduct workflow, such as checking e-mail or using fire service applications on their devices.

Ninety three point eight percent (93.8%) of respondents reported that computer technology can play a larger role in the fire service/department.

Ninety six point nine percent (96.9%) of the respondents believe that computer technology can improve the fire service/department.

Ninety three point eight percent (93.8%) believe computer technology can improve their work product. The same number 93.8% report they do not feel threatened by computer technology.

Analysis of the software log in data for Fire House Software © revealed the following:

Thirty three (33) of 35 personnel or 94% were identified to have logged in to the software over the analysis period. The required frequency of logging in to the system is at a minimum

once a day that an employee is on duty. Log in data revealed that personnel logged in only 15.8 out of 22.75 days worked, this represents 69% compliance.

Analysis of the Outlook © email system for e-mail one (E#1) revealed the following.

For the purposes of this survey compliance was measured by, if or when the e-mail was read. One hundred percent compliance was expected. One hundred percent compliance was never achieved. Eight point five percent (8.5%) deleted the e-mail without reading it. Eleven point four percent (11.4%) took no action on the email. Eighty point one percent (80.1%) did eventually read the email. Thirty one point four percent (31.4%) took longer than 30 days to read the email or did not read the email at all.

Analysis of the Outlook © email system for e-mail two (E#2) revealed the following.

For the purposes of this survey compliance was measured by the employee completing the act of creating a network account with the National Fire Academy. One hundred percent (100%) compliance was anticipated. 91% compliance was achieved in the time frame of this research project. The average time for compliance was 22.3 days.

Reviewing the data from the survey it appears the answer to the research question is that the Brigantine Fire Department is utilizing information technology adequately. That answer does not hold true when the data from the software log in, and email compliance data is reviewed. Members only logged in to the mandatorily used software 69% of the time. Only 80.1% of respondents actually read the e-mail. It took almost 30 days for members to read a priority e-mail (E#1) related to operational safety. That same e-mail (E#1) was read by just 81% of the department. It took greater than 22 days to comply with a departmental order sent via e-mail

(E#2). Compliance with E#2 was 91%. The research results support the old adage that actions speak louder than words.

The results of the research show that individuals who are principally affected by the non-compliance are the front line employees, the administration of the department, and any customers the department serves. This is due to the nature of the components examined.

The research is unable to show if the information technology needs of the BFD&EMS are being met. This is due to the fact that there is non-compliance with the requirements of technology use currently supplied by the department. The information provided in the literature review indicates that the allocation of the D block broad bandwidth is a significant achievement for the fire service. It will take further research to understand what that success will mean to the BFD&EMS in the future.

The research shows that information technology can be applied to increase efficiency and effectiveness. The literature review provided the example of geographic information systems (GIS) as one way of applying information technology directly applicable to the fire service. The research survey shows that the employees have the expectation that IT will further enhance their workflow in the future. The research supports further application of information technology to increase efficiency or effectiveness within the BFD&EMS.

The research shows that there are IT applications engaged in the BFD&EMS in both fire and EMS software applications. The research shows that there are mobile applications available to the BFD&EMS and that 70% of the employees are using their own mobile applications to support workflow within the department. The research also shows that mobile IT applications will be supported in the future via the Spectrum Act. The research also shows that 70% of

employees are willing allow their own mobile devices to be used to engage fire service workflow.

The research indicates that majority, but not all, employees' are utilizing IT to their advantage. The survey result indicates that 100% of the employees are knowledgeable about the IT assets available to them. The research does not clearly delineate why some members of the department are not utilizing the IT to their advantage. It does provide some possible explanations as to the reasons for non-compliance. Examples such as being required to use IT non-voluntarily; or not being able to break with the past are given. Another example is employees not seeing IT as a commodity to accomplish workflow.

Discussion/Implications

Technology is pervasive in the 21st century. The information technology in the fire service is no longer a nice thing to have but a critical commodity for any fire department. This research project was important to the BFD&EMS as a tool to assess the departments IT assets and its employees' attitude and behavior as it relates to information technology.

What was interesting in this study was that the literature review did not find much information on the use of information technology in the fire service. Initial queries of the databases used provided little result when using the term "computers" combined with "firefighting". This, and another interesting fact; that three textbooks published by fire service industry information leaders, such as Fire Engineering, the NFPA, and IFSTA, contained little information on IT to offer to a reader. This indicates that the fire service in general needs to be doing a better job of embracing information technology. Perhaps the passage of the Spectrum act will give the fire service the "shot in the arm" it needs to further integrate IT. Popper et al

indicates that technology should be viewed as a commodity but this research shows that this may not be the case for the BFD&EMS employees.

The research on the BFD&EMS shows that it is doing a good job of embracing IT. However, compliance and utilization must be improved. In this author's opinion, employees must be compliant with IT requirements greater than 95% of the time. This is due to the critical nature of information. Information related to first responders must be processed and acted upon because lives and property could be at stake.

The fire service was affected by the attacks on the territorial United States in 2011. Lessons learned from that event are that first responders were on the front line of a new war. Intelligence sharing is a critical component of war and IT resources are needed to share intelligence.

As this relates to the BFD&EMS, the study has shown that the nature of E#1 refers to intelligence sharing and operational safety. Not having knowledge of the intelligence contained in the e-mail could have negative consequences.

The study indicates that the BFD&EMS department's administration is negatively impacted by the inability to send communications in a efficient and effective way.

A surprising result of the study was related to mobile technology. Sixty five percent (65%) of the BFD&EMS employees indicated that they would use a mobile IT asset they own and pay for to be used for department purposes. This has such broad implications it warrants further research.

The military has shown that off the shelf commercially available mobile IT can be utilized in the field. The BFD&EMS and the fire service in general should take the lessons learned from that military experience and apply it to the fire service.

The study revealed BFD&EMS employee behavior is an issue. There is lack of action when it comes to compliance with IT guidelines of the BFD&EMS.

The study did not show if the IT needs of the BFD&EMS are being met. This was not able to be determined because there is not proper compliance with the IT policies in place. Additionally the survey was deficient in asking that direct question. Any answers to this question are circumstantially implied by the literature review. An example would be that the BFD&EMS would benefit from GIS applications.

Use of simple IT; such as e-mail systems and data entry software creates learning situations, which educate the user about the technology. The user interface of many IT systems appears and acts in a similar way. This is important because once a fire service employee masters the interface of a simple IT system; he/she is now prepared to engage in a more complex system. Even complex IT systems have an interface that looks and act similar to simple IT systems.

Recommendations

The purpose of this applied research project was to investigate and identify the current status of utilization of information technology within the Brigantine Fire Department and Emergency Medical Service. The study has successfully completed that task. The results of the study indicate there is room for improvement. The following recommends are offered to the department.

1. The department currently needs to have its employees comply with the current standard operating guidelines for information technology use within the department. The focus is to get the employees compliant and not have a solution that is punitive in nature. To achieve this training class(s) could be provided. A NFIRS training program is offered at the National Fire

Academy training web site. The class is free and it can be completed at the employee's convenience while at work. The NFIRS training is not necessarily going to get employees to comply. It will expose the employee to the importance of information and data. Employees will see the NFIRS as an information commodity rather than a reporting system. Learning may lead to compliance and will expose the employee to web based training programs.

2. Investigate the possibility of getting employees to use their personal mobile devices for fire department business. An important aspect of this would be to get all information and technology programs the department currently uses web hosted. Web hosting is less costly for an organization because there is no software infrastructure support needed. If you can get access to the Internet, you can use your web hosted software and information. Mobile devices make this very efficient and effective.

3. Investigate further the applications and networking being used by other organizations, especially the military. Focus on customer service, the "customer" being other departments within the municipality, state, and federal levels.

4. Begin investigating and planning for the implementation of a geographic information systems (GIS). This will greatly enhance the response capabilities of the department. The department's unique barrier island geography lends itself to be a place where GIS can make a difference in department operations. This is also one of the operational incentives of the National Fire Association. This means that perhaps there are grant dollars available for implementation.

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Appendix A
Survey Questions

[SURVEY PREVIEW MODE] Fire Department Information Technology Survey

Fire Department Information Technology Survey

*** 1. What is your age group?**

- 18 to 30 years old
- 30 to 40 years old
- 40 to 50 years old
- 50 to 60 years old
- older than 60 years

*** 2. How many employees does your department have?**

- 1-10
- 10-50
- 51 -100
- 101-200
- 201-300
- 301-400
- 401-500
- >500

*** 3. Does your fire department provide access to a computer work station to carry out departmental business?**

- Yes
- No

*** 4. Does your fire department provide an e-mail account for work purposes?**

- Yes
- No
- Not Sure

*** 5. If you have an e-mail account at work how often do you check or use e-mail?**

- Every work day
- Every other day of work
- Every third work day
- Once a month

[SURVEY PREVIEW MODE] Fire Department Information Technology Survey

- Every other month
- Never

***6. Do you have an E-mail account for use at home?**

- Yes
- No

***7. If you have an e-mail account at home how often do you check or use e-mail?**

- Every day
- Every other day
- 3 times a week
- 2 times a week
- 1 time a week
- Never

***8. Do you have access to the internet in your place of work/employment?**

- Yes
- No
- Not Sure

***9. If you have internet access at work how often do you use the internet?**

- Every work day
- Every other day of work
- Every third work day
- Once a month
- Every other month
- Never

***10. Does your Fire Department have a department sponsored internet web page**

- Yes
- No
- Don't know

***11. Does your Fire Department provide access to Wireless Fidelity (WiFi) at the station?**

- Yes
- No
- Not sure

[SURVEY PREVIEW MODE] Fire Department Information Technology Survey

*** 12. If WiFi Access is available at your station what is it used for?**

- Access for departmentally owned wireless devices ONLY
- Access to the internet via personally owned computer
- Access to the internet via personally owned smartphone
- Access to the internet via personally owned special device such as an iPad or Tablet device
- N/A

*** 13. If you have access to WiFi how often do you use it?**

- Every work day
- Every other day of work
- Every third work day
- Once a month
- Every other month
- Never

*** 14. Does your fire department use computer software to support fire operations?
example: National Fire Incident Reporting (NFIRS) software.**

- Yes
- No

15. If your fire department uses software to support operations please identify the name of the software

*** 16. Does your fire department use computer software to support EMS operations?
example: EMS Charts**

- Yes
- No

17. If your fire department uses software to support EMS operations please identify the name of the software

[SURVEY PREVIEW MODE] Fire Department Information Technology Survey

*** 18. Does your fire department use software for tracking or managing station duties?**

- Yes
- No
- Don't know

*** 19. Does your fire department use computers for training personnel?**

- Yes
- No

*** 20. If your department uses computers for training how are they used?**

- Instructors use computers to present information
- Personnel independently use computers to complete training
- Both instructor and individual use of computers for training
- N/A

*** 21. Do you use/own a smart phone or any tablet device such as an iPad?**

- Smart phone (phone with applications or e-mail access)
- Tablet device
- Both
- Neither

*** 22. If you use a smart phone or tablet device do you utilize any fire service related applications (apps)?**

- Yes
- No
- N/A

*** 23. If you used a smart phone or tablet device would you be willing to use your personally owned device to conduct fire service/department business such as receiving e-mail or use fire service applications on your device**

- Yes
- No

[SURVEY PREVIEW MODE] Fire Department Information Technology Survey

*** 24. In your opinion do computers have a application or use in the fire service/department**

Yes

No

25. Do you believe that computer technology can play a larger role in the fire service/department?

Yes

No

*** 26. If computer technology played a bigger role in the fire service/department would it improve or degrade the the fire service/department**

Improve the fire service/department

Degrade the fire service/department

*** 27. If computer technology played a bigger role in the fire service/department would it improve or degrade the the quality of your work in your fire department?**

Improve my work

Degrade my work

*** 28. Does the use of computer technology make you feel threatened or intimidated while at work?**

Yes

No

*** 29. In the next 10 years will computer technology play a smaller or larger role in the fire service /department?**

Larger role

Smaller role

Done

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