PicReport – Draft

Honor Pledge: I acknowledge that the Capstone Project is an independent study project to be completed individually. On my honor, I have not received aid on my Capstone Project other than what was provided by my faculty mentor and any persons explicitly cited in my work. I further acknowledge that if I have given any aid to another student in this course, the instructor of this course was made aware of my contributions.

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Objective

For my IT capstone project I am developing a prototype version of an application called “PicReport” or PR for short. The idea behind PR is to help first - responders and military personnel collect descriptive information for reports quickly from witnesses by using a series of images rather than through verbal description alone. The background on PR stems from my experience in the military. While in the U.S. Army I often communicated with people who spoke little to no English who could provide information that would help in the detainment of wanted criminals.

Even with the help of an interpreter it can be difficult to get information quickly and accurately due to various factors including the education level of the witness and differing dialects between the witness and the interpreter. The use of images in reporting information can be applicable to a wide range of scenarios in which a person is questioning someone with physical impairments, children, and those who may have issues explaining a specific descriptive detail for whatever reason.

The thesis for this capstone project is that an image based reporting tool can be effective in expediting the collection of information by law enforcement in situations where their subjects are unable to articulate themselves. My expectations for this project are that it will be difficult to complete all the features I intend to implement by the end of the semester. Therefore, I am limiting the functions of the prototype to only include vehicle description to allow ample time for development

and research. I will measure the effectiveness of the application by conducting practical exercises using images to relay a description.

Client

The primary user of the PR application will be a person who needs to report information that is time sensitive. The most common example would be police officers that need to question witnesses who may not be able to effectively communicate in English or any other language. Security guards may also be put into a position in which they must gather information to pass onto the police and may not have an interpreter to assist them. A third user that may benefit the most from the PR application is military personnel deployed to hazardous locations around the world. To elaborate on each user and why they would benefit from the PR application we will begin by detailing the police in the United States.

Police officers and criminal investigators are responsible for reporting and investigating crimes (What Police, 2014). Officers and investigators often collect information from various sources to include people in order to prosecute criminals (What Police, 2014). Security guards are often located in areas where police are not present, which makes them responsible for reporting information to the police (What Security, 2014). Security guards commonly perform tasks that include writing reports based on observation, interviewing witnesses for court testimony, and detaining violators (What Security, 2014).

Each branch of the military has personnel responsible for conducting interviews and investigations. For example, in the U.S. Army if you're in the military

occupational specialty field of Human Intelligence Collection then you are responsible for reporting on enemy capabilities through debriefings and interviews (Human Intelligence, 2015). With the aforementioned career fields there is one thing all three have in common. All three careers require the ability to gather information and report it. Thus, the PR application is well suited to aid in situations where someone gathering information must communicate through a language or culture barrier.

Faculty Adviser

Dr. Thomas Narock

Biography & Credentials – Dr. Narock is well read having graduated from the University of Maryland with a Bachelors of Science in Astronomy as well as earning his Masters of Science in Physics from John Hopkins University (Creating the, 2014). He also went on to earn his Ph.D. from the University of Maryland in Information Science (Creating the, 2014). Dr. Narock has worked as a research scientist at NASA and currently teaches web development, mobile development, and data science classes at Marymount University (Creating the, 2014). His work in application development has addressed real world challenges such as his work with GeoLink and OceanLink (Creating the, 2014). Dr. Narock's experience in the field of applied technology with applications is not only relevant to my research project, but will be essential in overcoming my development challenges.

Project Plan

Progress made so far on the PR application includes the completion of the initial topic selection, peer review, and this draft of the proposal. All the necessary application development tools have been downloaded and installed onto my personal computer. Research has led to the discovery of related applications to the PR application. For example, a travel application called "Image It" that utilizes pictures of items to help tourist communicate with locals has provided insight on design ideas for PR (NCY, 2015). Another application that is relevant to the PR application is called Canopy Translator, which was created to help medical staff communicate with patients (Tahir, D., 2015). Initially development was to occur on Cordova, but after issues with an older operating system on my computer the development platform was switched to Android Studio.

Android Studio was successfully installed and a project called PicReport was created in early October 2015. A compilation of photographs of the most popular vehicles driven in the United States has been stored on my hard drive. Storyboards and wireframes have been created to direct development and ensure intuitive flow of the PR application. Looking toward the future more focus will be on logical sequence of the pages and creating a friendly interface through Android Studios. By November 12, 2015 I expect the first 5 pages of the application to be completed through Android Studios. These pages will include the login screen, language selection, report type (Report a vehicle, report a person), select vehicle page (van, truck, sedan, or sports utility vehicle), and the color selection page.

By December 4th, 2015 the expectation is to have completed four more pages in the PR application, which will include ten of the most popular vehicles in a variety of colors and options to view the front and back of the vehicle. This is not predicted to be an issue to complete after the initial photograph pages are produced. It will mainly be a process of replication and the photographs have already been compiled into folders. The function on each page will be mainly related to tapping and swiping on the screen to allow users to interact with the application. Once these functions are coded the majority of the work will have been completed.

Resources

There are various resources that are necessary for the completion of the PR application. Internet resources have served as the primary research method, which includes access to the online Marymount library research catalog. The physical library at Marymount has also been utilized to check out books related to language barriers and related challenges. The Apple and Google application stores were used to download related content that have provided reference material for the development of the PR application.

Other necessary resources include relevant user surveys. User feedback will take place toward the end of November 2015 and will involve interviewing personnel who are the intended target audience for the PR application. This will involve contacting a local police department in order to request an interview with a criminal investigator. Colleagues will also be asked to participate in exercises where

the functionality of the application is tested to gauge performance and to provide feedback.

Project Details

Some may question where the PR application falls into the process of collecting information when so many methods already exist. How can PR improve upon current methods and will it actually expedite or hinder the process of interviewing witnesses? These are some questions that this section addresses. In locations all across the country law enforcement personal conduct interviews on witnesses to include police stations, in public areas, and within residential homes. Many of these people are not properly trained on the correct method of questioning which leads to improper interviews of the witness (Snook, B., Luther, K., Quinlan, H., & Milne, R., 2012).

One general rule that should be followed when conducting an interview is the 20/80 rule (Snook, B. et al., 2012). The rule is supposed to limit the time the interviewer is speaking to twenty percent of the time and allow the interviewee to speak eighty percent of the time (Snook, B. et al., 2012). This rule allows for more information to be gathered in a shorter period of time. Unfortunately, studies have shown that the 20/80 rule is rarely adhered to (Snook, B. et al., 2012). The role of an interviewer can never be eliminated to the point of no speaking however the PR application will act as a speaking tool for the interviewee at critical points in the interview.

The points in the interview in which a person is describing a person or a vehicle is likely one of the most important pieces of information that interviewer can collect. This means it is critical that the information is recorded accurately. If there are language barriers or physical impairments then the use of images is clearly an ideal method to overcome such obstacles along with the use of an interpreter. The use of images in interviews is not new. Fischer and Geiselman described how the "enhanced cognitive theory" reinforces the use of images as a way to guide an interview in 1992 (as cited by Davis, M. R., McMahon, M. & Greenwood, K. M., 2003, p.34-35).

Studies that have compared accuracy of information based on groups questioned with images and groups questioned without images have shown similar results (Davis, M. R., et al., 2003). However, the same studies have also show that with an increase in questioning comes an increase in errors with the information obtained, which makes sense (Davis, M. R. et al., 2003). This may be attributed to different factors such as the stress and comfort level of the interviewee (Davis, M. R. et al., 2003).

These points prove that PR will not be a magical solution, but it will serve as another tool that interviewers may use when it is appropriate to do so. Images used as a means to communicate are universal in that we use road signs in every developed country in the world. Images have also been used by researchers in developing the language abilities of the severely mentality handicap with much success (Romski, M. A. & Sevcik, R. A., 1996)

With PR the biggest challenges in the future will be to make the application useful to interviewers rather than a burden that will be disregarded after a failed attempt at utilizing it. With multi language applications it is more difficult than with most applications to ensure usability. However, this is not to say it cannot be done, as was the case with Julian Chen who worked for IBM in the early nineties (Buderi, R., 1998).

Chen was an engineer, but was fascinated with linguistics and spearheaded an effort to make a program that could be installed on computers that would make the computer usable by native Chinese speakers (Buderi, R., 1998). Chen succeeded by recording over 100 native Chinese speakers and treated the vowels in Chinese as they would be treated in the English language to develop his program (Buderi, R., 1998). This example shows that language barriers can be overcome with the appropriate solution.

Applied Knowledge

To complete the research and development of PR it will be necessary to incorporate my past professional and educational experience. My military and contracting experience will serve as the primary source of information for questioning sequences and related topics within the PR development process. I have approximately eight years of working experience conducting interviews and related task in which I had to overcome language barriers. This puts me in a unique position to provide relevant insight into the development of the PR application.

My educational experience at Marymount University will drive my ability to develop the PR application. The skills I gained from Web Development (IT-125) in developing web pages with the use HTML5, CSS, and JavaScript will help me design various pages with the PR application. I furthered my development experience in the "Topics in IT" class focused on mobile development (IT-360). In IT-360 I learned to use a variety of tools to develop applications across multiple platforms. The experience I gained from IT-360 will be applied through the duration of my capstone project. Software Engineering (IT-210) provided me with foundational knowledge necessary in the planning and development of software applications. I have completed various writing intensive classes while attending Marymount that have helped develop my writing and research capabilities.

Risk Factors

The user interface is the main obstacle for my project and needs to be intuitive and effective enough to convince users to implement the use of the PR application. If this does not occur then users will revert to the current method of reporting information with the use of other resources. If the application has screens that are not easily understood by the user it may cause users to dismiss the use of PR altogether. This risk must be mitigated through in-depth planning, research, surveys, and wire frame diagrams. By identifying issues in the design, customer satisfaction can be gained upon the initial release of PR.

There may be concern that the deployment of PR will eliminate work for linguists or interpreters. However, the PR will be marketed as a supplement and not

a replacement for a human translator. Many organizations that employ interpreters are often short staffed and must make due with the personnel they have. The PR application will act as a supplemental tool that can help perform initial and time sensitive reporting in the temporary absence of an interpreter. Once an interpreter is available to translate with a PR user a more in-depth report can be recorded.

Software coding will certainly create challenges that pose a risk in completing the prototype by the timeline outlined in this paper. Coding errors will be addressed by referencing online resources. If referencing online sources does not resolve the coding issue then I will meet with my faculty advisor to work through the problem. The software will be divided into modules so that if I get stuck with one section I can continue working on another section until the problem can be addressed and resolved.

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