What is FAST ?

FAST, (the First Aid Support Tool) is a revolutionary addition to the common first-aid kit that empowers seniors to travel worry free! The goal of FAST is to give seniors the confidence to travel anywhere around North America, through knowing that they now have an extra layer of medical support.

FAST is a computerized interface that is embedded right into a normal first-aid kit. It gives seniors the ability to respond to emergency situations in the case that 911 or help is unavailable, to properly handle routine first-aid problems, and ensure that they travel with the necessary first-aid and medical supplies based upon their personal medical history.

Users interact with FAST through verbal queues, and through a touch screen interface that is usable by anyone. Even if you haven't used a computer before, FAST will allow you to handle your urgent medical situations immediately. Simply opening up the lid of the First-Aid kit that FAST comes with, activates the system, and FAST is waiting to help you through whatever major or minor situations you have.

Who are the Target Users for FAST ?

The target users for FAST are mobile seniors, from about the age of 55 to 85, who are interested in traveling.

Large numbers of seniors are purchasing motor-homes and doing lots of traveling during their early to mid retirement years. Focusing FAST on the mobile seniors market provides the best fit, and the greatest number of advantages.

The main focus of FAST is to empower people to stay mobile by giving them the ability to handle emergency situations, deal with routine first-aid problems, and make sure they are carrying the proper medical supplies. This is of most benefit to mobile seniors, who have started to worry more about health risks and possible emergency situations they could encounter while traveling. This fear may actually prevent them from traveling in some circumstances. FAST would give them that extra amount of medical confidence. It would be of special benefit when seniors had traveled into an area of the country where there is no 911 present, for example the Ottawa region did not have 911 service until 2 years ago. The lack of 911 support is still very common around rural North America. FAST is also useful at campsites or roadsides, where a phone is not always within immediate reach and someone needs immediate first aid assistance.

The main focus for the initial versions of FAST would be on the North American market, and therefore would be aimed at the English speaking population. As long as users were able to read English at a grade 8 level, and were able to talk in English, the FAST system would be completely accessible to them. Future versions of FAST would be adapted to the non-English speaking senior populations such as French, Italian and Spanish. Since the user interface is extremely intuitive, and only offers a maximum of 3 choices in many scenarios, users need not have any previous computer experience, but, must at least be open to the benefits that this new use for technology offers.

FAST has been integrated into a standard first-aid kit, which normally weighs about 5-10 pounds at the most. Therefore, users of the kit would have to be able to lift the 5-10 pound weight, and be able to travel with it a short distance. This level of activity is within normal functioning for a 55 - 85 year old. Modifications such as a incorporating a shoulder strap or latch to attach to a ‘walker’ are being considered for seniors with physical limitations.

User Contact Ideas and Insight

From the very initial phases of our development of FAST, our team has had a strong focus on user centered design, and we have stuck to that through several iterations of Brainstorming and user feedback. The evolution and results of our brainstorming sessions have been documented in the Section on Brainstorming. There were a number of insights from users that will be discussed in more detail here.

The first form of good feedback about our ideas came from a member of our group who we will call user G. Since User G is actually a part of our group, they became one of our primary initial feedback resources, since they were the only User we have been in touch with in person so far.

User G has taken his first-aid course and has worked closely in an environment with lifeguards. Their feedback was initially very good because it allowed our group to quickly gain some insight into the different needs of emergency and routine first-aid situations. User G was familiar with the varying situations that could arise when in an emergency, and aided in a quick design of a scaled down visual user interface, and the initial mockup of FAST screens in a PowerPoint presentation.

The screens for the emergency scenario were scaled down so that the user, pointed out by User G, who might be very flustered, or might have a number of other things going on around them at the time, would require absolutely a minimum of decisions to make in each screen. This forced us to have our emergency user interface to be yes/no in nature and have an option for the person to be shown how to perform a first-aid activity (the show-me button). These buttons appear exactly in the same positions from screen to screen for consistency. Another interesting observation by user G was that the button color might need to be of a neutral color (instead of RED say) since if the color of the button was red , and the question prompted by FAST was “Is the Person Bleeding?”, the person using FAST might associate the red “NO” button with Blood and press “NO” when they really should have pressed “YES”. This is one of the subtleties that was influenced by User G.

Another form of very good user feedback came from a 49 year-old, who was a former lifeguard. We will refer to him as User H. He was talked to over the phone.

He affected several crucial elements in our design.

Firstly, an initial debate of ours had been placed upon whether or not to pursue a strictly point and click touch screen interface, or go with a combination of touch-screen and verbal. Upon talking to User H, he was, to our surprise, quite adamant about the two interfaces being absolutely necessary. If anything, the verbal should come before the touch screen interface, since emergency situations rarely allow you to have two hands free, and a touch screen interface would considerably slow down one’s response to a situation if they had to go back and forth from the person being looked after, to the FAST unit sitting inside the first-aid kit.

The second recommendation by User H was to incorporate the already field tested methods of the 911 decision tree that 911 operators use to guide people through emergency situations. This issue of how we were going to get the logic behind our interface, which walked someone through emergency situations, had not been discussed yet, and this was great input. Although our design team has yet to discover the details of exactly how the 911 decision tree is implemented at 911 call stations, it is our desire to incorporate most of the logic of their system into as many portions of FAST as possible. This would allow us to further justify the legitimacy of our product to the public, and limit us from reinventing the wheel in terms of placing many first-aid like procedures into an electronic format. A larger part of our future efforts could then be placed into mapping the 911 emergency decision trees to our FAST system instead of 'reinventing the wheel'.

Our third major form of User feedback came from a Registered Nurse (RN), who we shall refer to as User N. User N was initially very interested in our idea, but from being in the medical field for a number of years, and since we approached her very early on in our concept development , she realized that without any substance or mock up to show her of what we were proposing, that it wasn't worth making too many detailed comments on. She thought that it was necessary to initially supply us with several first-aid manual's in order to give us a real feel for the procedures that we would be dealing with. These helped formed the basis for our initial day in the life scenario, and allowed us to see how the real first-aid procedures would be mapped to FAST, and what these might look and feel like for a user as we placed the procedures into our PowerPoint mockup of FAST.

At the present time we have not taken a mock up of the FAST functionality out to any users in person, or in the field. (This could initially be done for the emergency functionality, with the PowerPoint demonstration that was developed.) However, future phases of our development of FAST will focus on a more detailed task analysis of 911 operators, incorporating User N, User H, and another elderly person into the design team. We will also focus on communicating with traveling seniors and seniors about to begin traveling, to better understand how the other two elements of FAST will be best incorporated; the routine first-aid interface and the documenting of medical history, and creation of a medical travel checklist for the senior.

Brainstorming Ideas and Insights.

In order to best show how the user feedback and insights were incorporated into our design cycle so far, the following section outlines what was accomplished at each of our recent meetings, and how the user insights and ideas fueled, and catalyzed new ideas and directions that FAST has taken.

For each meeting the ideas have been outlined in point form to best show their logical flow.

Meeting 1:

This was our first meeting for FAST after our initial idea to create an electronic first-aid kit had been chosen.

- Thought about electronic first aid book.
- We thought it was a positive because it wouldn't single out seniors. Everybody has a first-aid kit anyway!
- Electronic first-aid book because first-aid book included with first aid kit is not sufficient, (i.e. is not an intuitive , slow, easy to miss facts, doesn't show you how to use the equipment effectively.)
- Can then use the multi-media capabilities of the computer interface.
- So that can have on-line video tutorials on how to perform first-aid procedures.

T.A. Input

- Provided detailed criteria to begin looking into.
- Find out how we are going to divide up major and minor incidents.
- How you are going to prompt them in Emergency situations and what is the best way to do so?

User G Input

- Utilize first-aid manuals to get better understanding of procedures, and how they will fit in to FAST best.

Meeting 2:

-Talked about a body type of interface for emergency situations. See Appendix A
- Person would point to the shoulder on a picture of a body, if that's where the injury was.
- Trip planner proposed. could plan medical needs for a trip and incorporate medical needs with where your going. i.e. Mexico, Africa etc.
- Create a more extensive medical database that would augment existing first-aid manual.
- Look-up topic index - could look topics up by index, so that in emergencies would just go to an index instead of to the body type interface.
- Procedures based on western medicine practices
- Medical reference on different family members etc.

- Possibly verbal mode + audio video clips.
- Possibly only verbal , or only touch screen , or both interface ?

User G Input

- Cannot really sufficiently handle first aid situations with body diagram or indexing. Must have simpler interface for emergency situations.

User H Input

- Base your emergency procedures on 911 decision tree.
- Audio Absolutely mandatory but keep touch screen as the default.

Meeting 3:

- From group past experiences - fist-aid training need simpler interface than even an index for at least the initial stages emergency situations. The ABC's.
- Talked about visual body interface plus an index for normal situations.
- Therefore 2 modes. emergency and routine.
- Mapped out what screens in FAST should look for an emergency situation where someone broke their leg. We specialized the situation to get more specific feedback and to create our first day in a life scenario.

Meeting 4:

- No additional functions were suggested for FAST.
- Developed PowerPoint mockup of the proposed user interface for emergency situation above. This PowerPoint mockup included audio clips that verbally told what the user would hear from FAST as audio prompts for them to perform specific actions etc.
-Group was able to get an idea for what actual FAST might be like. PowerPoint demo might serve as a good method of getting user feedback on FAST's emergency interface in future stages.
- Modified the PowerPoint presentation mockup to have more limited instructions at start of user interface
- Established ABC's before attempting other medical treatments.
- Firmed up our initial emergency tree, before took the user into a more specialized 911 tree.
- Finalized day in the life scenario for emergency situation where someone has broken their leg.

The ideas and insights from our initial users allowed us to scale down our initial design, and begin thinking about ways that FAST would actually start to deliver some of the functionality that we had envisioned. Most of our initial efforts during the first few phases were on developing the Emergency based interface. The brainstorming and user feedback phases to come will emphasize the Routine first-aid functionality, and the medical travel checklist.

Proposed Functionality.

The functionality of FAST allows it to accomplish its main goal, to keep seniors traveling and mobile. Who otherwise may decide not to travel because they are scared of running into emergency situations they cannot handle.

FAST gives seniors the confidence they need, to travel worry free.

Its three main components:

- The Emergency Support Coach.
- The Routine First-Aid Tool.
- The Medical Travel Checklist

FAST is embedded into the inside of a typical first aid kit. When a user opens up the first-aid kit, they immediately view the touch-screen interface that is integrated right into the top lid of the kit. (see Appendix B)

To activate any one of the functions a user just says the word on the button, (i.e. ‘Emergency’ or ‘Checklist’) or touch the button right on the touch-screen itself.

The Emergency Support Coach

The Emergency Support Coach is a verbal and visual set of algorithms based upon the 911 emergency decision tree. The 911 emergency decision tree was chosen solely on the fact that this is the tool that professionals rely on when they are trying to guide people to perform basic first aid procedures. Since the knowledge of first aid training is still relatively limited, 911 is fairly dummy proof. This gives us the confidence that it will also work on this scale.

The user can go through this mode by either verbally queuing FAST or touching the screen. In emergency mode all text that is displayed will also be read out loud verbally. If concepts are difficult to grasp, the user can request video clips or cartoons that may illustrate the idea(s) better. The goal of the emergency mode is insure that the injured is free from any severe health situations (involving Air, Breathing, Cardiovascular and Bleeding).

The Routine First-Aid Tool

For minor injuries or for information, users can select the 'Routine' mode to roam through FAST's huge collection of medical information, from a variety of disciplines western medicine, homeopathic care and eastern medicine. The user can roam through the information through either two methods: verbal or visual. In the verbal mode the user can request for the information by telling FAST to display the information (i.e. heart attack). In the a quieter setting the user can request the information by following an electronic index or a graphical interface of the human

body. Once the information has been found it treatment to the condition will be presented in three means: text, audio (read the text) and a short to the point video clip(s).

Most likely scenarios:

- Heatstroke or Sunstroke
- Minor cuts and bruises
- Muscle strains or pulls

The Medical Travel Checklist

When a person is about to leave on a trip or vacation, they can open up the FAST first-aid kit, and select Checklist option either verbally or by touching the screen on the 'Checklist' button. They will then be able to enter any new personal medical information that have to enter into the system, such as new medications, or afflictions that have been identified. FAST will generate for them a checklist that the user will use to prepare their first-aid kit appropriately for the trip. This checklist will outline items to add to the first aid kit, and other items that should be stored external to the kit. This checklist will be generated for any number of people who are traveling together.

Most likely scenarios:

- Traveling in a motor-home across the country
- Going to the grandchildren's house during Christmas

A Day in the Life Scenario.

The functionality of FAST can essentially be divided up into two main categories. Emergency and Non-Emergency situations.

To illustrate how FAST would be used for each of these main areas or functionality, two separate “Day in the life Scenarios” will be used

Scenario 1:

Emergency -
Driving accident - Broken leg.

Brian and Ethel are both 68, and have just bought their new motor home. They have just arrived at a campsite in Texas. Brian finds a spot in the back end of a very large campsite, in a semi-secluded spot, and is backing the motor home in, while Ethel stands behind the motor-home and guides him in. While walking backwards and guiding the ‘home’ in, Ethel slips on some gravel, and gets hit by the back end of the motor-home. She falls to the ground, and breaks her leg in the process but is also knocked unconscious. Brian, hearing the thud, rushes out of the motor-home to see what has happened. He sees his wife lying on the ground unconscious with blood around her leg. He was trained in first aid years ago, so knows to call for help. Since he doesn’t have a phone handy, he simply yells “Help!!”, and hopes someone hears, but he knows he must act fast.

Time: 0 Accident has just happened.

Since this is a serious accident, he knows to make sure his wife is breathing and does so. She is breathing. But the blood coming from her leg! he can’t remember what to do? Brian then rushes in to the motor-home and grabs the FAST first-aid kit that the motor-home came with, and takes it to his wife.

Time: Accident + 1 minute

Brian opens up FAST, and he is greeted instantly with FAST’s initial screen, and a voice saying “ Emergency “ or “ Routine “ ? Brian responds intuitively with “ Emergency “ and he is then taken into a series of screens which get Brian to perform the typical first-aid ABC’s in proper sequence.

Time: Accident + 2 minutes

A person has heard Brian’s call for help and has come over. Brian tells them to go call 911 if they can, and the person agrees, but says the nearest ambulance is at least 15 + minutes away.

Brian answers YES or NO
to FAST’s initial questions, and FAST determines that Ethel is bleeding severely. FAST then takes Brian into a ‘show-me’ mode which allows Brian to view how to wrap a proper tourniquet around Ethel’s leg.

Time: Accident + 5 minutes

Ethel's leg has stopped bleeding. FAST tells Brian to wrap a blanket around his wife and wait her if he has been able to call. Someone has already called for help so he waits with her.

Time: Accident + 20 minutes

The ambulance arrives, and Brian is glad he had FAST in order to help him get the bleeding under control, since his wife might not have made it the 20 minutes until the ambulance showed up.

Scenario 2: Non-Emergency
Elderly lady gets sun-stroke

Ethel has gotten back from the hospital from her accident and is now back out at her motor-home with her husband. She wants to just sit outside and relax so she goes and sits down in her lounger. The lounger doesn't have a canopy on it, and Ethel ends up falling asleep. Two hours later Ethel wakes up and finds herself woosy and sun burnt in the middle of the afternoon heat. She feels tired and sick and dizzy but doesn't know if its the sun or just that she's tired from her accident.

Two friends from around the campsite come by and one says she must have heat stroke , the other says she's likely to have sun stroke. So , not knowing what to do about it, Ethel goes and opens up FAST, in the Routine mode, and Searches on the words "heat stroke' and "sun stroke" she finds out that she has actually had sun-stroke from the information that FAST has given her, and then tells her how to deal with it appropriately, how to avoid it in the future even if she is outside, and how to best calm the aching , sun-burnt skin.

The Team.

Chris

Name: Chris Coutlee
Student #: 931 747 940
e-mail: g6coutle@cdf

Team Roles: Technical Writer, Programmer / Macromedia Director Expert.

Chris' Strengths and Expertise:

Chris has a strong background in Computer Science and Electrical Engineering. He is a strong programmer and has knowledge of
electronics. He also has artistic skills in the area of art and music, and is a competent writer. Chris will be a great asset in technical writing and as our Macromedia expert.

Richard

Name: Richard Huang
Student #: 966 042 470
e-mail: g7huang@cdf

Team Roles: Programming / Macromedia Director Developer, Prototyper.

Richard's Strengths and Expertise:

Richard has a strong background in both artistic, and mechanical drawing, along with experience in visual design. Richard's mechanical
drawing expertise will greatly enhance our prototyping and his core skills in computer science will add great value in the area of Macromedia development.

Tony

Name: Tony Chou
Student #: 920 428 360
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Team Roles: Coordinator, Prototyper

Tony's Strengths and Expertise:

Tony has a very strong artistic background, and many years experience in the service industry with strong communication skills. He is well suited as a coordinator, and will also be invaluable in prototyping. Tony also has a background in the biological sciences and medical field and has work in a hospital setting. This will be of added
benefit to our group through all project phases.

Ted

Name: Ted Spencer

Student #: 920 723 440
e-mail: g5spence@cdf

Team Roles: User and Product Research, and Report Writing.

Ted's Strengths and Expertise:

Ted has a background in human physiology and the biological sciences, as well as hands on experience in physical therapy clinics. He has strong writing and research skills, and along with his expertise in Information Systems, he will be a strong asset to researching and report writing for the team.

Appendix Document

Information Gathering and User Testing

Research

The testing that has been accomplished has been relatively limited. Based on this limited information we have constructed the first concept model of FAST. This initial model will continue to change as we complete our initial research.

People in the professions that use first aid training as part of their job description would be the best sources of information on the best method of dispensing first aid information. These would include health professionals (such as doctors, nurses and paramedics), 911 emergency operator, first aid trainers (such as St. Johns). To complete the research some interviews with mobile seniors is needed to get a general idea of their thoughts on life and their physical capabilities, whether they can actually perform all the first aid tasks and their knowledge level of current technologies.

What this the research will accomplish is a better sense of what is information and resources FAST 1.0 will contain and support. This will help us throw out ideas that may be unrealistic, i.e. a mobile hospital unit and help us focus on more applicable functionality.

Testing Scheme

The actual testing will be divided into two sections, to test both the users' impression of the physical model and the computer interface. The test subjects will range from health professionals that were interviewed during the research stage and adults just about to retire (with or without background) and some seniors.

Physical Model

To test the physical model, we will be interviewing people that are already retired and living the mobile lifestyle. The physical testing will help us define what the user would like to see in the final product. Through this physical testing phase, such questions as “what are the ideal physical dimensions and weight of FAST?” can be determined. i.e. if FAST is too heavy then they will not use it, or if its awkward to carry around users will end up leaving it at home.

Goals of physical test

- Determine the maximum tolerable weight that FAST can be
- Durability of FAST (day in a life scenario)
- What is the best mode to transport FAST, i.e. suitcase, purse.
- Ease to set up FAST
- Location of medical equipment is well placed
- Contents of the medical equipment
- Method of recording the tests: written notes (questionnaire)
  video tape

Interface Model

The key to the success of FAST will depend upon its user interface. Our goal is to design FAST such that it will effective and useful, so that users will be more inclined to use

it again. The actual prototype used will either be developed on MS PowerPoint or Macro Media Director.

Interface Testing scheme

- Set up three-four quick scenarios for the user to attempt of accomplish with only FAST
- Test 911 decision tree - set up an emergency situation i.e. a broken hip situation
- Test routine lookup mode - text and visual i.e. a bee sting situation
- Test medical advisor - data inputting and modifications i.e. after a checkup, test results.
- Test additional properties of FAST audio output, voice recognition and display properties.
- Throughout the test we wish the users to talk out load so we can gauge their user experience.
- Method of recording: written notes (questionnaire)
  video tape