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Technological Delivery Methods of Community Safety Messages

An Interactive Qualifying Project Report

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by

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Abstract

Community safety messages are designed to help educate the public. This project, sponsored by the Australasian Fire Authorities Council was designed to help improve safety message delivery to young people, age 15 to 29, by making use of the newest technologies available. The team used interviews, focus groups, and a survey to gather information about communication technology and safety messages. The findings and the background research enabled the formation of recommendations regarding the future technological delivery methods that will be most effective for the delivery of fire safety messages.

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Authorship Page

This paper was written between January 10, 2007 and May 2, 2007. All the sections of the paper have been written cooperatively between the four members of the team – Larissa Amendola, Diana Damyanova, Stacie Gutowski, and Victor Herrera.

The members of the team contributed equally to all activities associated with the completion of this report.

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Nomenclature

000	Australian primary emergency service number
3G	Third generation
4G	Fourth generation
ABS	Australian Bureau of Statistics
ACMA	Australian Communications and Media Authority
Ads	Advertisements
AFAC	Australasian Fire Authorities Council
AIDS	Acquired Immunodeficiency Syndrome
AIM	American Online Instant Messenger
ALP	Australian Labor Party
AOL	America Online
APECS	Autonomous Public Emergency Communication System
CDMA	Code Division Multiple Access
CEO	Chief Executive Officers
CFA	Country Fire Authority
CFS	Country Fire Service
CIWS	Community Information and Warning System
CPSA	Commission on Physical Sciences, Mathematics, and Applications
CSG	Community Safety Group
DVD	Digital Video Disc
EDXL	Emergency Data Exchange Language

EMA	Emergency Management Australia
FESA	Fire and Emergency Service Authority
FPAA	Fire Protection Association in Australia
Gen	Generation
GIS	Geographic Information System
GPS	Global Positioning System
GSM	Global System for Mobile Communications
IM	Instant Message
IPND	Integrated Public Number Database
IRC	Internet Relay Chat
ISDR	International Strategy for Disaster Reduction
ISP	Internet Service Protocol
KMPG	Klynveld Peat Marwick Goerdeler
MFB	Metropolitan Fire Brigade
MFS	Metropolitan Fire Services in Queensland
MobiTV	Mobile Television
NICTA	National Information and Communication Technologies Association Australia
NFPA	National Fire Protection Association
NSW	New South Wales
NSWFB	New South Wales Fire Brigade
NSWRFS	New South Wales Rural Fire Service
OASIS	Organization for the Advancement of Structured Information Standards

OESC	Office of Emergency Services Commissioner
P2P	Peer to peer
PBS	Public Broadcast Service
PC	Personal Computer
PDA	Personal Data Assistant
PSA	Public Safety Announcement
QSFB	Queensland Fire Brigade
RMIT	Royal Melbourne Institute of Technology
RSS	Rich Site Summary
SACFS	Southern Australia Country Fire Service
SES	Socio-Economic Status
SMS	Short Messaging Service
STD	Sexually Transmitted Disease
SWOT	Strengths, Weaknesses, Opportunities and Threats
TAC	Traffic Accident Commission
USA	United States of America
VELS	Victoria Education Learning Standards
VoIP	Voice over IP
WPI	Worcester Polytechnic Institute

Executive Summary

Fire safety is an important topic for the general public in Australia. Fires are a problem for all of Australia, including both rural and urban areas. It is important to educate the public about the topic of fire safety in order to make them aware of the problem, what people can do to avoid starting a fire, and what to do when an actual emergency takes place. The Australasian Fire Authorities Council and its member organizations in Australia and New Zealand sponsored this project.

There are many different delivery methods for safety messages. These methods include traditional media such as the television, radio, and printed media and are expanding to include newer forms of technology. There are many new forms of technology that have not been utilized as a delivery method for safety messages. Young people, specifically those between the ages of 15 to 29 years old, use technologies such as mobile phones and the Internet most often among the general population. Moreover, fire organizations do not specifically target this age group mainly because the target group is hard to reach with traditional methods due to their feeling of invincibility, as well as their wide range of interests. All of these reasons provide an opportunity for fire safety organizations to explore using new technologies to reach young people.

The goal of this project was to investigate the current use of technology for safety message delivery, as well as what can be been done to utilize new technology to improve safety message delivery in the future. The investigation consisted of background research that allowed the team to learn about the different areas of urban and rural fire risk in Australia, community safety education, generational trends

(specifically Generation Y), and the present and future of communication technology.

In Australia, the team conducted a series of interviews, focus groups, and surveys. The interviews were conducted with people from fire safety organizations, technological experts, a demographics expert, emergency services personnel, and a health educator. The focus groups were organized with several different groups including fire safety volunteers, firefighters, and university students. Surveys were gathered from 395 university students in the greater Melbourne area in order to gain a statistically representative sample of the preferences and knowledge of this age group with respect to communication technology and safety messages.

The results from the interviews, focus groups, and surveys as well as the background information were used to make recommendations and identify methods that could be used in the future to deliver safety messages to young people. Interviews were helpful in gathering detailed knowledge about message content, demographics information, and technical details about current and new technology. The focus groups allowed for in-depth discussion with members of the target age group in order to gather information regarding current usage and to obtain ideas for new delivery methods. The results from the survey indicated that traditional media is the most commonly remembered form of message delivery. Survey results also indicated that most people in the target age group do not recall receiving safety messages in the past six months, thus indicating a need for newer, more effective message delivery methods.

Based on the analysis of the information, the team determined the best ways to reach people within the target age group in the future. The analysis techniques that the

team used included a Strengths Weaknesses Opportunities and Threats analysis of each proposed method, a Growth Share Matrix comparing share of the market for the technology and its prospect for growth, and a discussion of findings from literature review, interviews, focus groups, and survey data. Current safety message delivery methods include traditional media, Internet, and mobile devices. The methods that would be most effective in reaching the target age group in the future may expand to include video games, alert systems, and peer-to-peer networks. Specific methods are proposed in the body of the report.

1 Introduction

Community safety messages are important in helping to raise public awareness about a variety of issues. It is important for people to know how to help avoid the risks and circumstances of emergency situations (such as earthquakes, wildfires, tsunamis, etc). It is also important for people to know what actions should be taken in the event of an emergency. Much research has been completed regarding community safety, as it is a global concern, and there are a number of organizations responsible for the safety and wellbeing of the public. This project was sponsored by the Australasian Fire Authorities Council (AFAC), an organization that is responsible for facilitating communication between different fire, emergency and environmental safety groups within Australia and New Zealand (see "AFAC Members and Structure" in Appendix A).

AFAC consists of eleven groups, that each deal with different aspects of the organization's responsibilities. The specific division of AFAC involved in this project was the Community Safety Group (CSG). The mission of the CSG is to "provide advice to AFAC on matters that relate to the cost effective prevention and protection of life and property from exposure to fire and emergency incidents" (*AFAC: About AFAC*). The manager of the CSG is Rob Llewellyn, who has been working for AFAC since 1995 and is a fire safety analyst with previous experience with Telecom Australia, Commonwealth Fire Board, and the Postmaster-General's Department in Australia. He is responsible for "anything and everything that relates to community fire safety" (*AFAC Team Members*).

The problem stated by the AFAC CSG was that current safety message delivery

methods for younger generations, specifically Generation Y (1981-1999), Generation Z (2001-present), and iGeneration (1990-2000), may not be appropriate as new technologies are introduced and increasingly utilized. AFAC member agencies have acknowledged the need for a broader set of delivery methods in addition to the traditional methods, which include television, radio, pamphlets and newspapers. Such delivery methods might incorporate the use of Internet, mobile phones[1], iPods and broadcasting systems. The purpose of developing additional delivery methods was to make it possible for community messages to reach a wider variety of people. Although AFAC member agencies use different methods of delivering community safety messages, neither AFAC nor its member agencies have investigated the use of some of the newest technologies available or those that will be available in the upcoming years. The goal of AFAC and its member agencies was to establish what types of communication technologies were currently being used on a daily basis among the younger generations in order to incorporate the use of these technologies into new delivery methods.

The greatest challenge presented by this project was predicting the probable trends for the next five or more years with respect to how technologies will be used by people to communicate and gather information. It was necessary to analyze what strategies would be most effective in delivering safety messages by making use of the newest forms of communication technology and to determine to what extent such strategies would be applicable to the particular topic of safety messages in Australia and New Zealand.

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[1] Mobile phone are also referred to as cell phones in other places i.e. the United States

The goal of this project was to determine what technological delivery methods would be most effective for community safety messaging to young people in the future. This included the investigation of current communication technology usage as a method of community safety message delivery and an understanding of the development of future technologies. Recommendations regarding the delivery methods of community safety messages with respect to current and future technology usage were made to AFAC as a result of the project.

2 Background

There are several topics that were investigated in order to determine what types of technological delivery methods would be most suitable for the delivery of community safety messages to the younger generations. These topics included: the importance of fire safety, current delivery methods for community messages, exploration of the younger generations, and the future of communication technology.

2.1 Fires

Idealistically, society desires to live in a risk free environment. However, there are many catastrophes of both natural and human origin. Fires are a worldwide hazard that put property, human life, natural resources, and the economy at risk. Wherever people are exposed to the risk of fires, hazard prevention becomes a very important task. Risk communication in the home and workplace, and about wildfires near residential settings is vital.

2.1.1 Residential Fires

Residential fires are fires that occur in homes, offices, and public buildings. Each year there are more than 10,000 residential fires in Australia causing more than 1,500 injuries and 70 fatalities (*Australian Bureau of Statistic, (ABS)*). The most common causes of house fires are cooking, smoking, and electrical faults in products or house wiring. According to ABS most residential fires were accidental and could have been prevented. Home fire safety is an important issue. The installation of smoke alarms, fire sprinkler systems, access to emergency numbers, knowledge of fire hazards, and emergency escape planning are highly important.

2.1.2 Wildfires in Australia

Wildfires, previously referred to as bush or brushfires, are a concern in many places around the world. Areas that are highly susceptible to wildfires are those that experience extended periods of dry, hot weather usually accompanied by droughts. Australia has a history of severe wildfires. The country's dry climate with high temperatures, strong winds, frequent periods of drought, and wide variety of highly flammable flora all provide an extremely hospitable environment for wildfires *(Victorian Government Department of Sustainability and Environment*). The peak of wildfire season in different regions of Australia changes with latitude (*Victorian Auditor*). For example, as illustrated in Figure 1, Southern Australia experiences most of its wildfires during the summer and the fall, New South Wales (NSW) and Southern Queensland are at high risk during the spring and early summer, while winter and spring are the most prevalent seasons for wildfires in the North. (*Australian Government Bureau of Meteorology*).

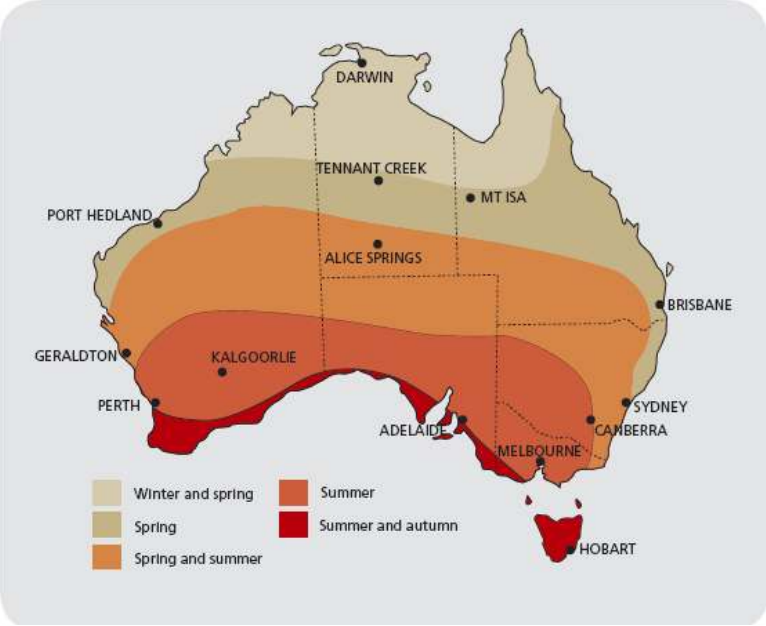


Figure 1 Distribution of Wildfire Seasons in Australia

2.1.2.1 Characteristics of Wildfires

Fires can occur as a result of human activities or natural events. According to the Victorian Government's Department of Sustainability and Environment, lightning is the primary cause of wildfires. Lightning is responsible for approximately 30% of wildfire incidences (*Victorian Auditor*). Figure 2 is a pie chart designed from the statistical data representing the causes of wildfires provided by the Victorian Government Department of Sustainability and Environment.

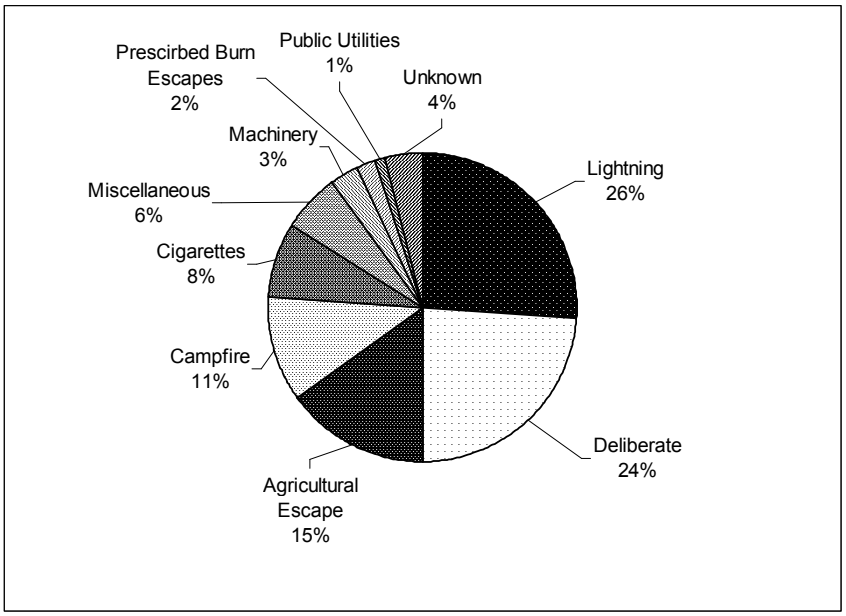


Figure 2 Causes of Wildfires

(Victorian Government Department of Sustainability and Environment)

Wildfires are a major disaster. They are capable of spreading with tremendous speed and causing great damage. Severe fires can travel as fast as 12 km/hr, and generate flames that are 100-150 meters high and thick (*Australian Government Bureau of Meteorology*). While wildfires have a much lower mortality rate than residential fires they do cause a large amount of property damage. According to Country Fire Authority

(CFA) “in total, taking into account both public and private land, around 3,500 wildfires occur each season.”

2.1.2.2 The Danger of the Urban-Rural Interface

In the past 150 years, half of the wildfires that occurred in Australia have been in the state of Victoria, which occupies only 3% of the total continent (*McGee*). Melbourne's urban-rural interface is one of the most hazardous regions for wildfires (*Australian Government: The Department of Environment and Heritage).*

Wildfires occurring at the urban-rural interface are especially dangerous because they have the potential of spreading quickly through the vast amount of flora and therefore can easily reach a large amount of property. When a wildfire occurs at the urban-rural interface, it is difficult for fire agencies to provide protection at the individual level (*Boura*). In the event of a wildfire the primary focus of fire agencies is to contain and suppress the fire so the least amount of damage occurs. The attention each individual property receives during a wildfire is less than in the instance of an individual house fire. Therefore, it is important that people living in areas that are susceptible to wildfires are familiar with wildfire hazard management for their own protection and wellbeing (*Victorian Auditor*).

2.1.3 The Need for Fire Safety

Fire safety is an important community issue and will continue to require constant attention and strategic management (*Victoria Audit*). It is critical that the public realizes that they as individuals may contribute to the outbreak and outcome of a fire (*Metropolitan Fire Brigade (MFB))*. For the most part, the issue of fire protection has been the responsibility of fire authorities and emergency services. Traditionally, the

focus of these organizations has been controlling environmental variables to reduce the chance of a fire starting and the intensity at which it could burn. In the past two decades the responsibility of fire protection has been broadened to include the community as a whole (*Australian Government: The Department of Environment and Heritage*). It is the responsibility of fire and emergency service organizations to provide the public with the education necessary to help prevent, prepare for, and make sensible decisions in the event of a fire.

Fire safety organizations aim to increase public awareness about fires and fire safety. Building public awareness then helps to promote behavioral changes. Young children, the elderly and the disabled are the populations with the highest risk of a fire related injury or death. Fire safety organizations direct the majority of their efforts towards the education of these groups *(CFA)*. For children, fire safety education is integrated into the curriculum of primary school. Children are taught simple but important aspects through interactive learning methods. These include fire drills, demonstrations by fire organizations, videos, fire simulations, and phrases such as "get down low and go, go, go!" Children are habitually good learners because they are interested in learning about the world around them and like to be involved. After primary school there are no specific programs or methods geared towards educating young people. By adulthood fire safety is usually an acquired instinct in most people's lives. This is especially true for Australians who live along the urban-rural interface and rural areas where wildfires occur frequently *(CFA)*. Adults are more concerned with fire safety primarily due to the responsibility of owning a home and protecting a family. Due to their motivation to protect their property and family, adults are generally more receptive regarding fire safety.

2.1.4 Public Awareness

In terms of fire safety, public awareness includes the knowledge of potential fire hazards, preventative measures, detection of existing fires, and suitable actions to take in the event of a fire (*MFB: Community Education*). Fire and emergency service organizations aim to increase public awareness by providing information so the public can become knowledgeable about fires and fire safety, and are then able to recognize and understand their risk in order to effectively protect themselves and their homes. Building community awareness is not only intended to save lives and reduce damage in the present day, but additionally with the expectation of achieving long term behavioral changes for the future. Figure 3, adapted from CFA, illustrates how community awareness is effective. The provision of information to the public initiates the cycle. Providing the community with the resources, skills, and motivation promotes them to take action. The idea is that short term behavioral changes will lead to the establishment of long term changes. Overall, the awareness of risk will be increased.

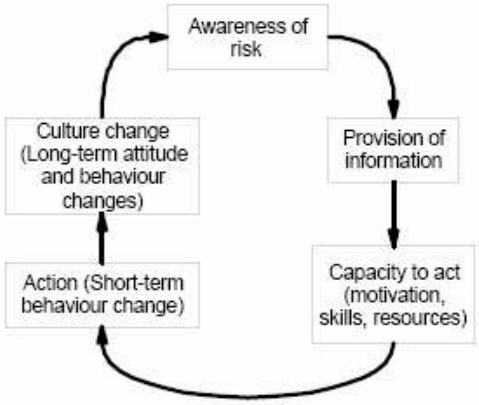


Figure 3 The Community Education Cycle

(*CFA*)

2.2 Community Messages

The magnitude of the problems related to fire in Australia requires high awareness of the general public regarding fire risk. There is a need to bring a wide variety of safety topics to the attention of the public. In general, various organizations, groups, and the government are capable of and take responsibility for raising awareness and educating the public on topics such as global warming, Sexually Transmissible Infections (STIs), fire safety, etc. Therefore, in order to create an effective set of delivery methods for public safety messages, it was important to first gain an understanding of what community safety messages are, how they are communicated, and to what extent the communication is effective. The tactics can be evaluated, modified, and applied to fire emergency messages.

2.2.1 Communicating Public Messages

Public messages have to reach the majority of or preferably the whole public. They can be health related (regarding Acquired Immunodeficiency Syndrome (AIDS), STIs, epidemics, alcohol, smoking etc.), emergency related (e.g. fire safety), global awareness messages (global warming, pollution), etc. Since the audience consists of many different groups, and the delivery methods have to be highly effective, there is a need for tailoring the message based on people's age, sex, socio-economic status (SES), and location. This adaptation can be in the actual message, i.e. different messages for different groups, or in the delivery method, based on what different groups use to obtain information.

The messages can serve two main purposes – to influence and to inform. In particular, messages that aim to influence the community can either encourage people to take a particular action, or can be enforced by a government organization (*CPSA*

Commission on Physical Sciences, Mathematics, and Applications).

Government organizations can encourage safer behavior regarding fire safety by implementing and enforcing fire safety laws. For example, the government can require that every university and employer guarantees that their employees and students have some form of insurance. However, such policies face many challenges and require careful consideration because "the material well-being of a democratic society depends on its ability to rationally manage a nearly limitless variety of often competing risks" (*Kahan et al*).

Moreover, different media can be used to inform the public about safety issues. Organizations are currently using written media - newspapers, pamphlets, the Internet; visual media – television, online videos; audio media – radio. According to Sheila Daley, who is the Co-Director of the Call to Action organization, a message's effectiveness can be increased when combined with a celebrity's popularity that can draw attention to the topic (*Daley*).

2.2.2 Fire Safety Messages

Community messages related to fire safety are especially important in Australia, due to the high number of fires. Organizations such as AFAC, MFB, and Fire Protection Association Australia (FPAA) focus on community messages. There are two types of fires safety messages, namely preventive and reactive. Preventive messages are designed to encourage members of the community to take preliminary measures and avoid fire hazards. Reactive messages are those ensuring that the public is aware of how to act in the case of a fire. A study by MFB shows that the majority of the public associates fire safety only with reactive messages. In terms of fire related safety

messages, people are more aware of the reactive messages, and thus the preventive messages seem to reach a smaller part of the public. Therefore, preventive messages do not fully achieve the goal of lowering risky behavior in respect to fire.

Preventive messages can be broken into several groups based on the target audience. The breakdown can be based on different characteristics. One of them is status, namely whether a person is in the position of enforcing certain behavior or not. For example, home owners can make sure that their houses have the proper fire prevention equipment and require tenants to maintain that equipment on a regular basis. Also, the government can require compliance from homeowners. On the other hand, every person should know what behavior to avoid in order to help lower the risk of fire in his/her everyday life. AFAC has several publications related to various topics, such as fire alarms, fuel storage, and others (*Australasian Fire Authorities Council: Message, Mission and Vision)*. Another characteristic by which groups can be segmented is age. The different age groups have different cognitive abilities and interests, but should receive the same message. More on that segmentation is discussed in following sections of the Background.

Reactive messages on the other hand, according to the study conducted by MFB on safety messages, reach more people, thus their communication is more effective. Nevertheless, there is always space for improvement that could lead to less damages and losses.

2.2.3 Communicating the Fire Messages

A number of organizations including AFAC, MFB, FPA Australia, and National Fire Protection Association (NFPA) in the United States, organize a number of

programs aimed at raising awareness about emergency safety. The need for these programs is justified by the results from a study by MFB targeting households from the Metropolitan Fire District that have been involved in a fire emergency. According to the study, 70% of the respondents believe there is a need for better messages. Based on the survey responses MFB claims there is a demand for the establishment of programs aimed at different groups of people. Specialization of programs makes them more effective because it takes into consideration the background of the target audience, what they are interested in, and what they react best to. Some of these programs are the *Juvenile Fire Awareness and Intervention Program, FLAME - Multicultural Information*, *Retire Ed Program*, *Fire Ed for Preps, Fire Ed for Grade Six,* and *SmokeBUSter* (*MFB: Community Education).* These programs by MFB are adapting the messages to the different age groups they are targeting – juveniles, students in preparatory school, retired people, students in grade six, and younger kids. Another group targeted separately is people whose first language is not English, for whom the traditional safety messages might not be effective *(MFB: Community Education)*.

Another organization that has educational programs engineered toward young children is the NFPA. Their character Sparky the Fire Dog is used in pamphlets and online games, which target predominantly the younger generation. The NFPA website is an interactive and educational source of information for younger children (*NFPA*). The website contains information about how to avoid fire hazards, as well as what to do during a fire.

2.2.4 Awareness and Methods Effectiveness

In order to create more effective delivery methods for safety messages it is important to understand the current situation. This includes an understanding of how

aware people are of fire safety procedures, and to what extent that awareness leads to safe behavior.

According to the MFB research on safety messages, only 4% of the most common responses suggest that existing fire safety messages have a preventive goal, meaning that the majority of the people asked believe that fire safety messages only explain what to do in case of a fire (*MFB: Human Behaviour in Fires Research Project).* This indicates that according to households that have been involved in fires, the perception is that safety messages are predominantly reactive and not preventive. In addition to enhancing the delivery methods of fire safety messages it is important that more emphasis is put on the conveyance of preventive messages.

It is necessary to consider the effectiveness of safety messages that are launched to grab the attention of the public. Before sending a public safety message it is important to consider how many people it will reach through the chosen delivery methods. It is also important to evaluate whether the received message leads to a behavioral change amongst the audience. According to the MFB study, awareness about fire hazards does not necessarily lead to safer behavior. This means that many people who have been a part of a fire accident still prefer not to take preventative action. The results of the survey say "while 92.3% of respondents stated that it was possible to have a fire again one day, only 64% stated that this risk was worth making the home more fire safe." The reasons range from financial to cultural, but often they are due to the underestimation of danger and the risk involved with fires (*MFB: Human Behaviour in Fires Research Project*).

It would thus be beneficial if fire safety messages were more widely distributed

to the public. This would help to increase public awareness of fire safety. The methods by which messages are delivered play a significant role in determining the quantity of people reached. It is also crucial to study the target audience to which the messages will be delivered.

2.2.5 Legislation: The Spam Act

There is a concern with the legal issues that are involved with the sending of safety messages via various forms of communication technology. According to focus group participants receiving safety messages on mobile phones, emails, or other personal devices seems like an invasion of privacy and an abundance of messages would be considered spam. According to the Spam Act issued in 2003 by the Australian Communications and Media Authority (ACMA) government bodies, political parties, religious organizations, charities, and education associations are exempted from the act. Factual information messages may be sent without prior consent of the recipient if the message contains information regarding the goods or services offered by the association or factual information messages. Fire organizations whether government or state owned are covered as an exemption to the Spam Act because their messages promote public safety (*Australian Government: Department of Communications, Information Technology and the Arts).*

2.3 Social Marketing

Community messages have been approached in a variety of ways. One of them is marketing, in particular social marketing. Overall, this project deals with marketing a product, namely safety messages to a target group of people who are 15 to 29 years old, in order to achieve the goal of increased public awareness. The difference between traditional and social marketing is that the product of social marketing is intangible, for

example health education or fire safety. Social marketing was established in the 1970s and developed by Gerald Zaltman and Philip Kotler, with the later known as the guru in marketing. It has been used in a number of government sectors and public awareness campaigns which target topics such as smoking, eating habits, voting, drowning, protecting the environment, etc. According to the marketing literature there are four steps in developing a good marketing plan: market research, marketing goals, marketing strategies, and monitoring and control. Below is the description of each one of the steps and its particular application to the project *(Kotler)*.

2.3.1 Market Research

Market research includes investigating the characteristics of the target audience, the communication technology market, the awareness on the topic of fire safety, and the relation between all of these subjects. These topics are described in detail later in this report. Primarily, it is relevant to understand the characteristics of the particular service marketed and how these characteristics are important to the consumer. For this project, the service is fire safety messages, and its importance was already discussed. The benefits of the service are safety and awareness. Its features include that it is cost free, short, easily accessible, and related to safety. The drawbacks include the amount of effort required to obtain the safety messages as well as the fact that it is not of immediate importance to the target audience. These factors are most important for the establishment of the marketing goals and for the development of the marketing strategies *(Kotler)*.

2.3.2 Marketing goals

The second part of the marketing plan is the establishment of marketing goals. The main goal is to create awareness among young generations regarding fire safety.

Another goal of the project that is typical for social marketing plans is to provoke a behavioral change. In this particular case, this means that people would accept a new behavior, reject a potential behavior, modify a current behavior, or abandon an old behavior. In order for these goals to be achieved, they can be divided into sub-goals, which are specific, measurable, achievable, realistic, and time bound. These sub-goals are most relevant for the implementation of the marketing plan. Sample goals might be to achieve a 5% drop in the fires started by young people or to achieve a 60% response to some message related to fire safety. The goals also need to be realistic, which requires an understanding of the market. Lastly, they need to be time bound, which means there needs to be some deadline for the goals to be achieved. It is important also to note that the goals might change in the process of implementation of the marketing plan due to the changes in the target audience preference and the available technology (*Kotler*).

2.3.3 Marketing Strategies

In order to achieve the goals established, there is a need for specific marketing strategies. The aspects of these strategies referred to in the marketing literature as Marketing Mix, are product, price, promotion and place. According to Nedra Weinreich, a consultant and an author working in the areas of social marketing, there are four more aspects, namely publics, partnership, policy and purse strings *(Weinreich)*.

2.3.3.1 Product

The product of the marketing plan is fire safety awareness. It is in the form of information about the prevention of fire and the information necessary in the situation

of a fire *(Kotler)*.

2.3.3.2 Price

The product is intangible therefore the price associated with it would be interrelated with the method through which it is attained. However, when the goal of the social marketing plan is a behavioral change, two things have to be taken into consideration. Firstly, the price required to obtain the service should not be too high, because it will not be adopted by the consumers. Secondly, the price should not be too little or free because it creates a perception of low quality, or is assigned with low level of importance *(Kotler)*.

2.3.3.3 Place

The place is the method through which the consumer attains the product. For the purposes of this project these methods are different forms of communication technology. When the product is intangible, careful consideration has to be given to the physical points of public access, such as public transportation, hospitals, markets, etc., as well as to the technological channels, such as mobile and internet networks, particular websites, systems, etc. *(Kotler)*.

2.3.3.4 Promotion

According to Nedra Weinreich "Promotion consists of the integrated use of advertising, public relations, promotions, media advocacy, personal selling and entertainment vehicles." These are only some of the methods to reach the target audience and to create demand for the particular service. In social marketing in particular a common method is public service announcements. The promotion part of the marketing plan is often considered the most important, but it is very tightly

intertwined with the actual message, which is out of the scope of this project *(Weinreich)*.

2.3.3.5 Publics

Publics are an additional part of the marketing mix that refers to the different parties involved in the program. This includes "target audience and secondary audiences, policymakers, and gatekeepers," as well as "those who are involved in some way with either approval or implementation of the program." All of these groups have to be considered in the process of development and implementation of the program in order for it to be successful. For this project this implies contacting various fire and safety organizations in Australia and gathering feedback from the primary and secondary target audiences *(Weinreich)*.

2.3.3.6 Partnership

Often the program of the social marketing plan is large scale and is very hard to be implemented through the efforts of only one organization or group. Therefore, partnership is a common method in social marketing. Partnerships should not be limited to organizations with the same purpose, but should also incorporate organizations with similar goals, or targeting the same audience. For example, AFAC is in partnership with a number of fire related organizations, but for the purpose of the fire safety messaging program, can be in partnership with health related organizations or those that are popular among the target audience. A successful method might be to reach the target audience by an incentive provided by a popular product among the target audience *(Weinreich)*.

2.3.3.7 Policy

Marketing strategies that target a large audience require that their implementation is supported by the surrounding environment. For example, when messaging a wide group of people you might need their permission to do so, therefore there is a need for them to sign up for a particular service. On the other hand, policy can be used to reinforce the marketing strategy. For instance a marketing strategy might be to use an alert system for fires in a particular region, and a policy reinforcing it can be that consumers need to register for that alert system in order to use Internet. However, this strategy has to be realistic as well, which means that none of the marketing mix parts can be considered as a separate entity *(Weinreich)*.

2.3.3.8 Purse Strings

Lastly, because of the nature of the program and its implementers, the cost of the project should be considered. The large scale of the projects might require substantial funding, therefore the methods should be realistically priced *(Weinreich)*.

2.3.4 Monitor and control

In order for the implementation of a marketing plan to be successful there is a need to have a method of monitoring and controlling the status of the goals. It is also important to monitor the markets and the target audience, in order to guarantee that the marketing strategies are still appropriate *(Kotler)*.

2.3.5 Conclusion

Social marketing is used in different areas of public communication. Its structure is similar to the structure of traditional marketing, but focuses particularly on intangible products. Even though implementation of the plan is out of the scope of this project, the aspects of social marketing discussed above should be incorporated in the

development of methods and recommendations.

2.4 Generation Y and iGeneration

The targeted age group of this project is 15 to 29 year olds. There are two generations included in this age interval: Generation Y and iGeneration. Generation Y represents those born between 1981 and 1999 (*Neuborne*). People of Generation Y are referred to as the Millennials and are mostly the children of the baby boomers. iGeneration, short for the Internet Generation, represents those born between the years of 1990 and 2000 (*Egnatoff*). The newest generation, Generation Z, consists of people born beginning in 2001, up to and including the present (*Neuborne*). Due to their very young age, Generation Z is not taken into consideration for this project.

2.5 Generation Y Creates the Need for New Marketing Techniques

According to Jim Meskauskas, Vice President Director of Online Media at ICON International, Generation Y is "the most media savvy, educated, and wired population to ever walk the earth." Individuals of this generation grew up in a world of emerging technology such as the Internet, mobile phones, and media devices. Accordingly, young people of Generation Y are early adopters and heavy technology users. Due to the wide array of technologies available, people of the younger generations use the traditional forms of communication technology such as the television and printed media much less than older generations do (*Meskauskas, Millennials Surfing*). In order to connect with the younger generations, delivery methods of public safety messages must evolve to make use of the latest technology.

2.6 Technology

Technology is constantly evolving. For example, mobile phones, iPods,

Personal Data Assistants (PDA), and the Internet did not exist fifty years ago, but all of these new technologies are available almost anywhere in the world today. Such technologies are not essential to human existence, but they are a tool that can be used to communicate, educate, and share ideas with a wide range of people faster than before. In their article "The Gift of Gab?" Taylor and Harper emphasize that technology is vital for communication. They describe how technology allows people to keep in touch with family and friends for social reasons or in case of emergency, a way to check in at the office, and provide access to information from almost anywhere, whether it is for business or pleasure. With the growth of informational networks and advancements in technology, the ability to access information and people will only continue to expand.

2.6.1 Television

One form of communication technology that has been around for several decades is the television. The first television with any similarity to those that exist today was introduced in the 1940s (*Encarta*). The television is now an everyday object present in almost every home in Australia and America, with 99% of households owning at least one television (*ABS: Household use of Information Technology, Australia).* There are numerous channels with everything from news to children's shows to travel documentaries to home shopping outlets just to mention a few. Along with the multitude of shows, there are many commercials that are played several times an hour on almost every channel. Commercials can be designed to appeal to a general or specific audience. Both television programs and commercials are used to inform and educate the public. For example "Reading Rainbow" is a show made to promote reading and literacy among children (*Public Broadcasting Service Kids*). There are many health related commercials from those that reveal the dangers of drug use, to

those discussing the importance of home fire detectors.

2.6.1.1 Evolution of the Television

Even decades after its invention, the technology of the television is still being enhanced. Improvements have been made to picture quality and program quantity. One of the most recent major changes in television technology is the introduction of devices that record and playback television. These devices, such as TiVo and computer-based media centers offered by companies such as Dell can record individual television shows, entire series of shows, share music and photos, buy movie tickets, view traffic and weather reports, and even schedule television recordings online (*TiVo Inc., Dell Inc*). TiVo and media center devices are useful because they allow people to record programs easily and quickly without having to deal with cassette tapes or even Digital Video Disc (DVD). These machines also allow remote access so that the user can set recording times from a different location.

Although these devices make television recording easier and faster, they also allow the user to skip the commercials in programming. This may be convenient for the typical television viewer, but it is a drawback for the companies paying for the advertisements as any consumer with access to a digital recording device is easily able to skip commercials altogether. According to Andrea Rangone and Alessandro Turconi from the *Politecnico di Milano,* "the convergence processes characterizing the multimedia age and leading towards the information society have primed a deep transformation of the television business, by broadening its boundaries and dilating them" (*Rangone and Turconi*). Television business and technology is not restricted anymore to a few companies. It is becoming a focus of other industries which include Internet and telecommunication companies. This is relevant to the project because it

encompasses the convergence of media. Messaging is increasingly interchangeable among different formats and in order to maximize the scope and penetration of the target, varied delivery methods should be used.

2.6.1.2 Decreased Television Usage Among Younger Generations

Despite all the enrichments made to television technology the television is becoming less popular among the younger generations. Between 1994 and 2004 there has been a 20% decrease in the average daily television usage among all viewers under the age of 24 (*Reikert*). More modern forms of technology, especially the Internet, have surpassed the television.

2.6.2 The Internet

The Internet provides access to a wide variety of information. There are several aspects of internet technology namely bandwidth, mobile devices, mobile users, intranets, information overload, and customization (*Kots*). A technological terminology section can be found in Appendix B. The three most prominent uses for the Internet are entertainment, education, and communication. The Internet functions as the gateway for various forms of online communication. These include email, instant messaging, online gaming, and virtual communities.

The Internet is especially popular among the younger generations. Approximately 75% of Generation Y uses the Internet on a regular basis. Due to the frequent use of the Internet among young people, Generation Y has been labeled as the "Always-on Generation." On average young people of Generation Y spend 12 hours per week on the Internet. This is 28% more than the amount of time spent online by

Generation X (*Reikert*).

2.6.2.1 Wired Internet Network Availability

Internet access by the Australian population is constantly growing. Reasons for this growth include increased accessibility to the Internet as networks continue to expand, as well as the increased need to have Internet available for daily access to communication and general information. In June of 2006, there were approximately six million internet subscriptions in Australia, half of which were broadband (*ACMA, ABS Internet Activity Survey*). Broadband subscriptions increased 88% in the time between June 2005 and June 2006, while dial-up accounts decreased by almost 25% (*ACMA, ABS Internet Activity Survey*). Dial-up is a cheap avenue for entering the internet market. Most dial-up subscribers will eventually change to broadband as these customers realize the increased service that is made available by broadband services. Still, there is a lack of internet availability in rural areas. Even though some rural homes do have Internet access, the connection speed can be slow and the service can be expensive *(ACMA)*. Therefore, Internet is not equally available to all people in Australia.

There are two general groups of people that do not have subscriptions to the Internet at home. These two groups are older Australians (those over 50 years old) and Australians with a lower than average household income, with each group representing about half of the non-use demographic (*ACMA*). This information shows that young people are more likely to use the Internet, therefore providing another possible delivery method for safety messages. Since so many young people use the Internet, it is important to use this technology as a way to deliver effective messages that will hopefully change dangerous behavior among young people or warn them about the

occurrence of potentially dangerous situations.

2.6.2.2 Fiber optics

The use of fiber optics to enhance communication is likely to occur within the upcoming years. The Australia Labor Party (ALP) has proposed a plan to provide a fully functional fiber optic network to 98% of the population within the next five to ten years (*ALP New Directions for Communications*). The new fiber optic lines would provide faster connections and greater download capabilities for subscribers, thereby increasing the amount of available information (*Nirmalathas-Interview*). The plan to expand fiber optics shows that Australia is ready to move forward with technology in order to provide better services for the customers.

2.6.2.3 Satellite Broadband

Satellite broadband is another form of Internet that is available to Australians, even those in rural areas, because the service works using satellites in space. Although this option is more accessible to all people, the service has a delay and therefore cannot be used for service such as voice over internet protocol (VoIP) which requires real time response. Satellite is also a more expensive option than wire-based services (*ACMA*).

2.6.2.4 Wireless Broadband

The third form of internet access is wireless broadband. Wireless connections can be found in many public places such as airports and coffee shops, but wireless internet service providers have expanded the market to include greater service availability in the larger cities of Australia (*ACMA*). Companies such as iBurst and Unwired are currently establishing wireless networks in metropolitan areas, claiming that up to 75% of the population will be covered once proposed network expansions

have been completed. WiMAX is another wireless service that is expected to provide better wireless coverage over longer distances. However none of these networks are currently available in Australia (*ACMA*).

The internet service providers (ISP) in Australia currently impose download (and sometimes even upload) limits on its customers. Some of these limits can be as low as 200 megabytes per month which would be used very quickly by any customer downloading video content (*ACMA*). With the current practice of charging customers based on download rates, it is important to consider whether anyone using the Internet would be willing to download a safety message in order to learn more about community safety. With plans for a significantly larger fiber optic network within the next decade, it may be possible to send pictures and videos to customers in Australia without them having to pay extra rates for using more then the allotted monthly allowance *(Eades-Interview)*.

2.6.2.5 Internet Advertising

The Internet is a popular place for advertising. There are many forms of advertising that exist on the Internet. The two main types of ads (advertisements) used for message delivery, direct and indirect. Direct ads contain specific information about the topic while indirect ads provide a link to another source of information, such as newspapers or other organizations *(Nirmalathas-Interview)*.

2.6.2.6 Instant Messaging

Another way people communicate on the Internet is through the use of instant messaging programs. Instant messaging is a widespread form of communication offered at no cost to internet users. Instant messaging is form of two-way

communication that allows for multiple two-way conversations to occur at once. Advancements to instant messaging programs have allowed users to do more than simply converse through the electronic transmission of text via the Internet. An additional capability of instant messaging clients is the ability to transfer files between users including documents, pictures, videos and audio files. Most instant messaging clients can also be used in conjunction with a web camera giving users the ability to view each other and hold conversations. More complex instant messenger programs such as the subscription-based program Skype, allow for calls to be made via the Internet.

Internet bots, simply known as bots, are an interesting feature of instant messaging programs. A bot is an automated application that talks with instant messenger users via an instant message. Bots can handle many tasks, including reporting weather, zip-code information, sports scores, converting currency or other units, etc. Bots allows users to ask questions and then formulate a response. Bots can deliver useful info tailored to a specific request. Both AIM, (American Online Instant Messenger) and IRC (Internet Relay Chat) operate several bots to provide information and entertainment to their users. Examples include Recipebuddie, AOLSafetyBot, AOL Yellow Pages, TrivaChatBot, Smarter Child, Moviefone Bot, and Parking Ban Bot (*AIM Bots*).

Advertising has been incorporated into the technology of instant messaging programs. For example ads and images are frequently displayed to instant messaging client users in their contact list or instant message (IM) windows.

2.6.2.7 Virtual Communities

Virtual communities refer to websites that allow people to express themselves on a digital level while sharing personal, funny, or interesting information, videos, and blogs (personal online journals/diaries) with people around the world. MySpace, Facebook, and YouTube are three websites that have widespread popularity among young people. *Time* magazine's end-of-the-year issue that summarizes events throughout the year, included the article "Time's Person of the Year: You" that reported on the popularity of these sites because of the increased ability to share experiences on a person to person basis, even if that person is halfway around the world (*Grossman*). Another article printed by the *Wall Street Journal* reported that a total of 9,305 person-years of time had been spent viewing YouTube videos and other media on the site since it began in 2005 (*Gomes*). *Business Week Online* reported 24.2 million users on the popular MySpace website over a year ago, and the popularity of the profile-sharing site has grown since that time (*Rosenbush*).

Blogging is a popular element of virtual communities. This term refers to the chronological publication of personal thoughts and web links. The term blog is derived from the word weblogs. The top blog network is Google-owned Blogger.com, which had 20.8 million visitors in May of 2006. MySpace Blogs ranked second with 14.4 million visitors, and MSN Spaces ranked third with a total of 9.6 million visitors. A large majority of blogging behavior is accredited to the younger internet users, especially those within the 12 to 17 year old age range. According to technology experts "Blogs are now as ubiquitous to the web as reality shows are to television" (*comScore Media Metrix*).

Virtual communities are fundamental in fostering online communication. Due to the high user volume by the younger generations, virtual communities have attracted the attention of advertisers who want to post advertisements that appeal specifically to this age group (*Meskauskas - Media Planning*). It is probable that community safety messaging will venture into virtual communities as well.

2.6.3 Video Games and Online Gaming

Video games are another device that is popular among people of all ages, in particular young people. They are a form of entertainment that is constantly improving and changing. Video games are made available for people of all ages with games ranging from number and color games for toddlers to first-person games that require skill, time, and attention to detail for anyone willing to invest the effort. These games can be found on video game consoles such as Nintendo and PlayStation as well as computers, with many different games available for each device. The popularity of video games has increased steadily from 1996 to 2006, with $7.4 billion in video game sales in 2006 (*Entertainment Software Association*). Video games can also be played online. Online games refer to video games that are played over some form of computer network, most commonly the Internet. Online gaming allows users all over the world to interact while playing multi-user games.

In his book What Video Games Have to Teach Us about Learning and Literacy, James Paul Gee describes how his four-year-old son was willing and eager to learn how to play a game even though it was a challenge. The child enjoyed the learning process involved with the game, even though it took concentration and patience. Gee goes on to comment about the necessity of good content in a game that is going to teach a child

something useful. If a game is simply some fantasy world with no message or learning involved in the game play, then it may be seen as meaningless by anyone who is trying to use video games as an educational tool (*Gee*).

In order to have a game that is useful as a learning tool, Gee elaborated on the different learning principles that are important for any type of learning whether it be on a game console or in the classroom. These important principles included the ability of the user to think on different levels while also learning actively and critically, or learning to the point of remembering, as well as continued practice with the activity. Therefore, in order for a game to be effective as a teaching tool, it should complete two different tasks: keep the user interested and teach the user something useful or important.

In the book In the Mind of a Game, John Flynt discussed the need for video games to involve exploration and problem solving for the game to be effective as a teaching tool. It is important for the game to be engaging while also teaching the player how to solve a problem, which he/she could encounter in the real world. A video game could certainly be used as an education tool provided that the game is presented in a way that it teaches the user while also being an engaging activity to keep the player entertained.

Simulation games are also quite popular; examples of these are Electronic Arts SimCity Second Life, and Firaxis Civilization. Simulation games provide the opportunity to create and control empires and cities. Control over many areas such as budget, number of civilians, land, and number of houses is given to the player to engage him/her in an active setting to find the best possible combination for the benefit

of his/her city or empire. These games have online and customization components that let players converge in networks and create and control their own environments.

Fire safety has already been incorporated into video and online gaming. Many fire safety agencies have activities and games available for children on their websites. The NFPA has a computer game that uses their mascot, Sparky the Fire Dog, to educate children about the importance of fire safety using games that teach the game player about home and fire safety awareness (*NFPA News Release*). In addition to educational games, there are also games available in the market that are not educational, and some that are a mix of both. In order for a game to be an effective delivery method it is important that it has an educational value.

Communicating risk using online games has not been extensively researched or developed, however there are interesting attempts done by different agencies. Examples of this are the "Stop Disasters!", "Living with Fire", and "Fire Boss" video games, developed with the purpose of teaching young people facts about wildfires, their consequences, and possible approaches to achieve safety.

2.6.3.1 Stop Disasters

A recent attempt to teach young people about natural disasters by means of a video game is the Stop Disasters video game developed by International Strategy for Disaster Reduction (ISDR). The ISDR is part of the United Nations organization and brings many organizations, universities, and institutions together in order to reduce the number of causalities triggered by natural hazards. The Stop Disasters video game lets players help communities survive through wildfires, tsunamis, hurricanes, earthquakes, and floods. The wildfire game is based in Australia and it lets players take control of a

community prior to a wildfire. The purpose is to teach players how to build a safer community in order to reduce human and material damage when the wildfire strikes. The initial interface is shown in Figure 4 Stop Disasters Initial Interface.

Figure 4 Stop Disasters Initial Interface

(International Strategy for Disaster Reduction, United Nations).

The initial layout is shown in Figure 5. It presents the image of an arid region with population in a small area with enough properties to be damaged during a wildfire if the right procedures are not followed in time.

Figure 5 Stop Disasters Initial Layout

(International Strategy for Disaster Reduction, United Nations)

The purpose of the game is to build a community for the population and keep them safe using an allotted budget. The players have different options of action; after building a school, a hospital, and protecting water towers around the area they have to build houses to accommodate a greater population. Other options are available such as having controlled fires that extinguish potential fluids or demolish forests that are close enough to endanger communities.

The final goal of the game is to prepare the community enough to resist the imminent wildfire. How well the player's community is trained determines how much damage occurs to the population and properties. This game teaches young people the importance of planning for an imminent disaster and can be a successful delivery method for safety messages due its customization capabilities which enable players to affect their environment in real-time, engaging them in a more immersive map *(International Strategy for Disaster Reduction, United Nations)*.

2.6.3.2 Living with Fire

Living with Fire is a text-based video game that lets the player make management decisions in case of a wildfire emergency. Game players are equipped with different people such as a meteorologist, a research scientist, fire planners and citizens. A sample case is a dry forest with enough fuels to be considered a threat; three options arise, do nothing, thin the trees, or thin the trees and burn them. The experts given to the players have to be consulted before choosing an option; the meteorologist can say that it is windy season, so perhaps starting a fire is not a good choice because it can spread to other regions, or the fire planner can say that he does not have enough volunteers to conduct a controlled fire. All of these options have to be taken into consideration by the player and after that a decision has to be made.

This game teaches young players how to observe a wildfire from many perspectives and develop solutions based on the information available.

Figure 6 Living with Fire Initial Interface

(Educational Web Adventure)

2.6.3.3 Fire Boss

Fire Boss is an interactive game where the player tests his/her skills against a wildfire in the Green Acres State Forest. As the fire boss, every fire season the player

prepares to protect the Green Acres State Forest from dangerous wildfire. The firefighters and firefighting equipment are ready for the summer. When a fire report comes in, the best place to send the firefighting team to help control the fire as quickly as possible has to be decided. The Fire Boss screen is filled with a large scale view of the State Forest, while along the right-hand side are several pop-up windows. The top popup-window is a mini-map which shows an overview of the whole world. The mini-map shows where the fire is (in red and black), where the resources are (in blue) and where the control lines are (as brown lines).

Green Acres State Forest is a large area that cannot be seen all at once. A fire control line is a path of cleared ground with nothing left to burn, and is created by bulldozers and crews. Control lines must be constructed with as few small gaps as possible, so that the fire cannot get through. Bulldozers and firefighters can be used to create control lines. Helicopters are used for dropping water on the fire, as well as watching it from an aerial view. The player will be given a helicopter some time after the start of the fire.

The final goal of the game is to move your crews and support in order and in time to cope with the real-time wildfire. This game is more engaging than the two previous ones due to irreversible decisions. This component might appeal more to young players than the customization capabilities found in the Stop Disaster! or Living with Fire video games.

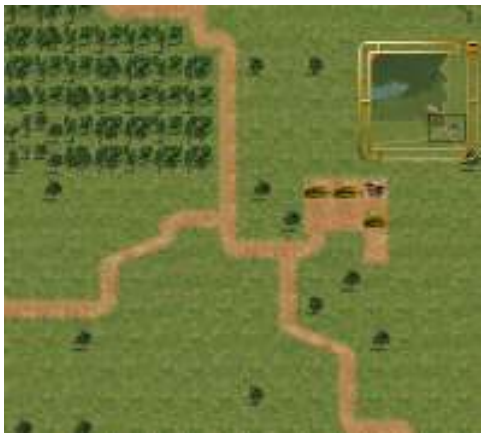


Figure 7 Fire Boss Game Interface

(Department of Sustainability and Environment, Victoria Australia)

Video games can be an effective delivery method for community safety messages when they provide an active learning environment. Video games that do not provide necessary information to promote safety awareness will not be educational. Games that are properly developed can become a popular form of entertainment that is both fun and educational *(Department of Sustainability and Environment, Victoria Australia)*.

2.6.3.4 Avatars

Virtual worlds and video games have created traits that people experience in the real world such as economic transactions, personal relationships, and political institutions. A person can experience these traits as an avatar, "which is the representation of the self in a given physical medium" *(Castronova)*. An avatar with varying characteristics exists in a specific virtual world and the human agent that chooses this avatar has certain inherent features that do not change due to the chosen avatar or virtual world. An avatar is an interesting area of research for this project due to the potential to incorporate them into different delivery methods (i.e. mobile phone,

online computers) to deliver community safety messages. For young people the preference would be an animated avatar to which they can relate, especially interaction among the human agent and the character rather than a simple character to watch (*Sheth*). Animated avatars could be placed in mobile phones or websites where young people converge to deliver safety messages.

2.6.4 Mobile Phones

Mobile phones are another popular communication technology device. They have given people the convenience of communicating with others at anytime and anyplace. In addition to calling and text messaging capabilities many mobile phones have other features incorporated into them including camera and video capabilities, games, the Internet, and the ability to listen to music.

2.6.4.1 Mobile Phone Network Coverage

A recent report released by the ACMA has shown that mobile phones are a popular device in Australia, with 19.7 million mobile phones subscriptions in June 2006 (*ACMA*). This is a significant number of services, as the population in Australia at the time of the report was approximately 20.5 million people (*ABS, Population Projections*). Major mobile phone carriers include Telstra, Optus, 3, and Vodafone. Mobile phones have three different types of networks in Australia; Code Division Multiple Access (CDMA), Global System for Mobile Communications (GSM), and 3G also known as third generation. According to the ACMA report, in 2007 98% of the population of Australia was covered with the CDMA network, while 96% was covered by the GSM network. Telstra, one of the major mobile service providers in Australia, is expected to discontinue use of the CDMA format by the year 2008, but the 3G network that will replace it will be expected to have equal coverage to that of the current CDMA

network (*ACMA*).

In addition to the mobile phone carriers listed above, there are also satellite carriers that can provide mobile phone services to 100% of the population in Australia. The satellite services are particularly useful in areas where other mobile phone companies cannot provide coverage. There are also some phones that have dual capabilities, working on CDMA or GSM networks if possible, or on satellite when no other network is available. Although satellites phones can be used anywhere in Australia, these devices are not as widely used due to the increased cost of the service as compared to traditional mobile phone carriers (*ACMA).*

In the year between June 2005 and June 2006 fixed line connections decreased by almost 2% (*ACMA*). There are several possible explanations for this, including the growing popularity of mobile phones, as well as the introduction of VoIP services. VoIP carriers provide cheaper services for fixed line coverage than traditional services, therefore providing a less expensive way for people to place calls. The drawback to VoIP is the requirement of a broadband connection, which is not available in all parts of Australia *(ACMA)*.

2.6.4.2 Mobiles and Generation Y

In 2004 89% of teenagers aged between 13 and 19 in Sydney and Melbourne had mobile phones (*Australian Associated Press*). For individuals of Generation Y it is considered a social necessity to own a mobile device. Taylor and Harper claim that "mobile phones provide a medium through which young people can sustain and invigorate their social networks." Although this idea may seem strange for some, there is evidence that young people (aged 16 to 19 years, in the study they conducted) see the

activity of text messaging on a mobile phone as a necessary social interaction. The claim is that the messages are a sort of "gift" from one person to another. Anyone without the ability to send and receive the text message "gifts" may not be as integrated into the culture of their peers with mobiles having text message ability. For the English students analyzed in this study, it is as if a non-text messaging peer would not be a part of the social life of his/her peers simply because so much emphasis has been placed on the text message. The research by Taylor and Harper shows that, at least in some cultures and places, text messaging with mobiles is an important method of communication among the younger generations of society.

2.6.4.3 Text Messaging

Text messaging is a very popular application for mobile phones. Text messages, more commonly referred to as short message services (SMS) are a popular tool for communication among mobile phone users. Some services such as MSN and Yahoo Messenger are even making internet text messaging available on mobile phones for a fee (*ACMA*). This additional feature greatly increases the number of people that can be contacted via SMS and internet text messaging, as both services can be available on one phone.

Some of the problems with current mobile phones are due to network and device capabilities. One of the problems is the lack of mobile network coverage. According to emergency telecommunications specialists, text messaging capabilities are not yet suitable for mass message delivery to all mobile customers. Current SMS messages are sent in the order they were received, so a large amount of messages being sent at one time may not reach the recipient in a timely fashion. The inability to process large amounts of information could pose a problem if SMS systems would be used to

send large numbers of messages during an emergency (*Ives, Simmons-Interviews)*.

2.6.4.4 Camera Phones

The incorporation of cameras into mobile phones was introduced in 2002. A camera phone allows users to capture and share pictures and videos with other mobile users. Nowadays, almost every mobile phone has a camera.

In a study by Kindberg *et al*. camera phone usage among people was studied in order to observe what kinds of pictures were being taken by camera phone users. While the article acknowledged that there is little research to date about the current use of camera phones, there was a trend within the study for people to use the photo capabilities of their phone to capture images of people or objects. This study also showed that these subjects typically captured their own images, and did not receive nearly as many images as they had captured. Still, more than half of the images were shared with other people via email or mobile-to-mobile communication. It was also noted that some of the photos were used "to tell or remind a remote person about something that needed to be done or to discuss it with them" (*Kindberg et al*). This behavior among camera phone users could be important for future message delivery systems specifically for visual forms of messaging.

2.6.4.5 Broadband Mobile Technology

Broadband capability has been established on a variety of networks including GSM, 3G (also known as third generation), and wireless networks, with the type of service dependent on the mobile service provider (*ACMA*). 3G refers to the most recent form of mobile technology standards which allows for the incorporation of voice data as in telephone calls and non-voice data such as text, Internet, downloads, and emails.

These mobile phones enable users transferring rates between 64 and 384 kilobytes per second (kbps). Users are able to watch television, download large files, listen to music, and browse the web freely. As the newer networks grow and more people obtain phones with greater capabilities, it is possible for videos and Internet to be available to more people than ever before, should they chose to use it *(Nirmalathas-Interview)*.

2.6.5 Global Position Systems (GPS)

A Global Position System (GPS) compiles data received from several different satellites in orbit above the Earth to determine where the GPS receiver is on the Earth's surface (*Smithsonian National Air and Space Museum*). In the future, it may be possible to send messages to GPS receivers via the satellites providing location information. GPS is a tool that could be used to inform people about possible life threatening events that are occurring in the area in which people are located.. These messages could be programmed to be sent to any GPS receiver in an area that is undergoing an event such as a wildfire. The GPS receiver would then alert the person of the impending danger, allowing the person to gather more information from local sources in order to assess the situation. This technology could be very useful in alerting anyone of an impending fire, flood, tsunami, hurricane, or other natural disaster that may threaten human life *(BlackBerry)*.

2.6.6 Alert Messaging

Alert messaging is a way of reaching the public with reactive messages. Several organizations and private providers are currently developing or providing such a service in Australia. Several systems, their development, and implementation are described in the following sections. The first one, Incident Alert, is a system developed by a private provider. It is followed by a system currently tested in Western Australia,

and a system under development in Victoria.

2.6.6.1 Incident Alert

The Incident Alert website is a warning system developed by Internet Development Australia. It emails and sends SMS messages to mobile phones to registered users notifying them of a fire alert in their immediate zone. The monitoring system alerts users only within the state of Victoria, using CFA information for this purpose. As of today it has approximately 2.000 users in with properties in the state of Victoria.

The target group of this alert messaging system is people who live in the city and have properties in wildfire areas. Figure 8 and Figure 9 show the interfaces that users will see the first time they use Incident Alert.

Figure 8 Registration Interface

(Internet Development Australia).

The main interface website lets users their different options like their different alerts and the email addresses and phone info they will go to.

Figure 9 Main Interface

(Internet Development Australia).

The most interactive part of this interface is the map in Figure 10. It lets users see the situation in Victoria and zoom in their particular region. Every circle in the map indicates the presence of a fire and the fire can have three states: going, safe, and controlled. This data is retrieved from the CFA database and updates itself every 3 minutes.

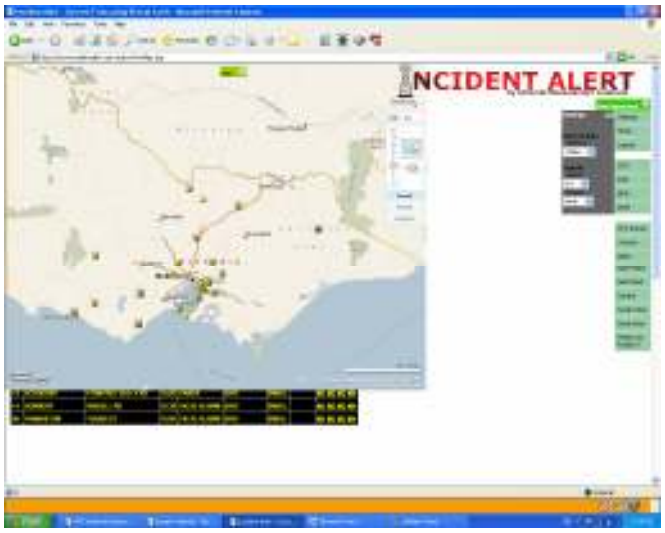


Figure 10 Map

(Internet Development Australia)

The Incident Alert main purpose is to notify registered users as soon as possible of alerts that threaten the property. The information sent to email addresses is quite simple and identifies the location, type of the fire, and its intensity; it does not give directions to registered users, except suggesting them to stay away from the danger zone in the registration process. Three emails and/or three SMS messages are sent during a fire and after it has been controlled. The time between these emails depends on how the fire develops. The first message states the information mentioned above and states that it is a GOING fire, the second messages states that the fire has been CONTROLLED, and the third message states that the area is SAFE again. Samples of the three emails are shown below

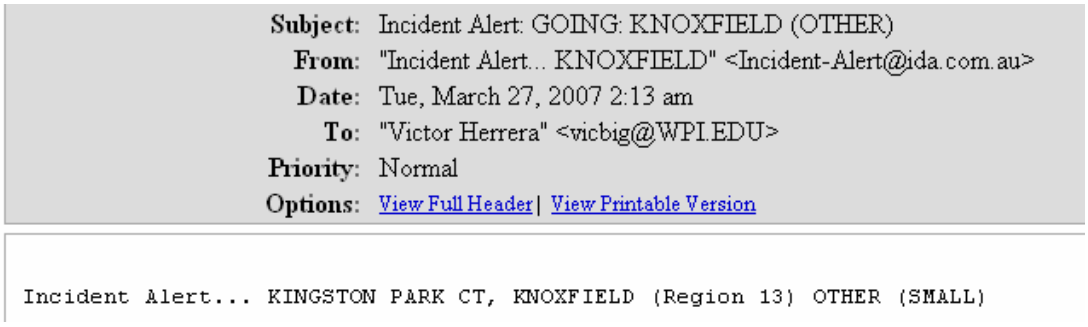


Figure 11 Alert E-mail 1

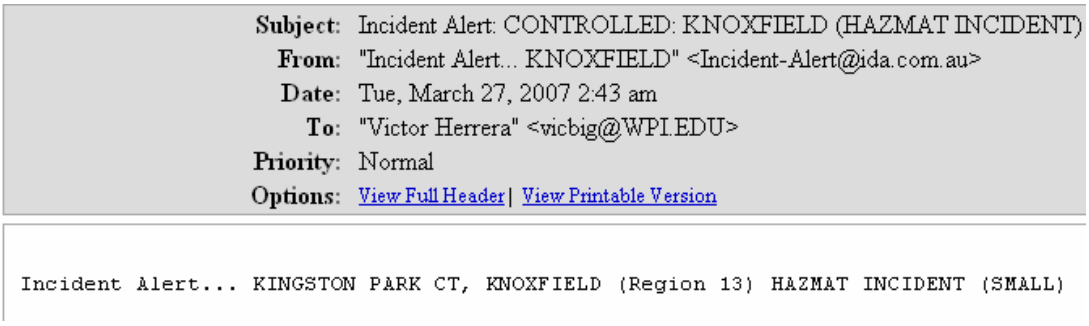


Figure 12 Alert E-mail 2

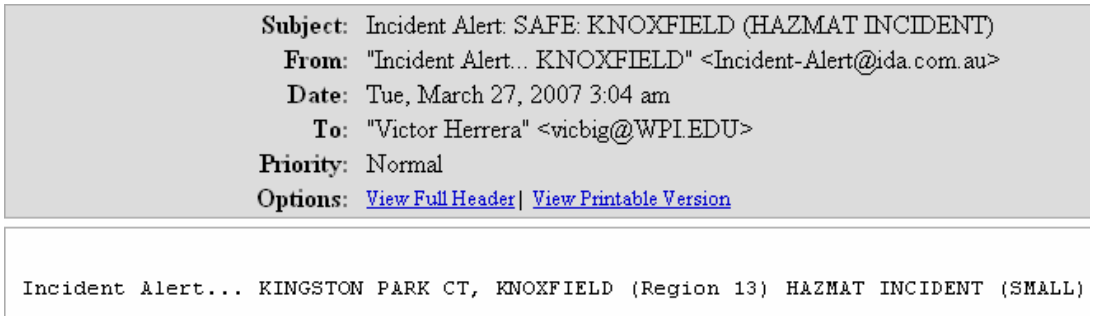


Figure 13 Alert E-mail 3

This monitoring system is in its early stages and has many promising add-ons in the near future. Mapping can be further developed and greater coverage within can still be achieved. Mobile 3G technology is also a great opportunity for this alert system in the future to send not only SMS messages, but also interactive maps where users using GPS technology can see the location of them and their properties and calculate the distance between these two, and hence have a greater basis to judge potential threats.

2.6.6.2Autonomous Public Emergency Communication System – Western Australia

The Autonomous Public Emergency Warning System (APECS) is an emergency communication system designed for the Government of Western Australia. The purpose of APECS is to increase resilience in order to cope with natural and human induced hazards. In times of emergency APECS uses effective public communication to protect communities from the impact any emergency can cause, and between emergencies it educates communities with preventive messages and stops the dissemination of false alarms.

APECS also allows many emergency agencies to coordinate their publications better among themselves. The system delivers messages via voice, fax, email, SMS, pager, online, and Rich Site Summary (RSS). The system is designed to reach the most

number of recipients, deliver clear and concise information, and increase the number of recipients who make the right choice in case of an emergency. The following is a list of the hazards that are communicated to the public by the system: wildfires, blizzards, snowstorms, draughts, earthquakes, epidemics, famines, floods, hailstorms, heat waves, hurricanes, typhoons, cyclones, tornados, ice storms, lahars, landslides, mudslides, sinkholes, tsunamis and volcanic eruptions.

A web-user interface presented in Figure 14 enables remote access for users.

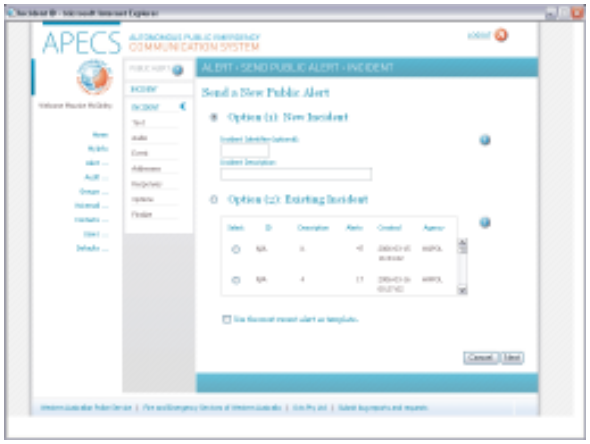


Figure 14 APECS Interface

(APECS)

In the website users can also register other data such as email, fax, and mobile phone number. The APECS can send alerts to the general public based on geographic location or to users who have registered for the service. The recipients are identified by an area on a map shown in Figure 15.

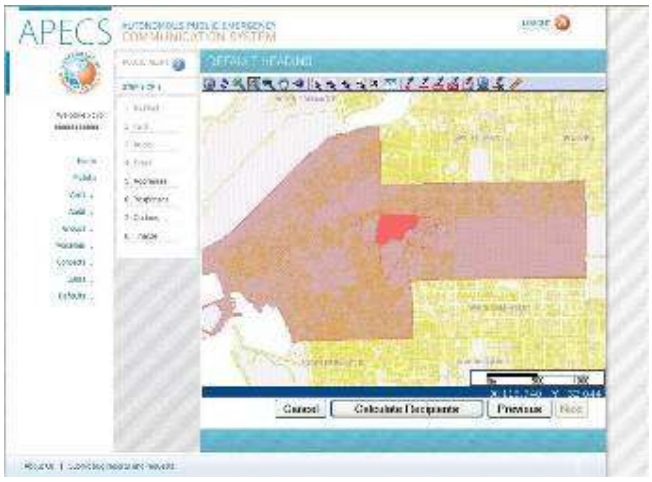


Figure 15 Map

(APECS)

APECS can send alerts to anyone in specified areas on the map and it also contains a database of registered users to send reactive voicemail alerts. The voicemail capability allows users to dial APECS for available public information that can provide the latest alert updates, general safety information or confirmation of a safe situation. Integrated RSS technology is included on the website for updated data relevant to the subscriber's geographic area.

APECS recognizes that users would only tolerate a certain number of alerts before they start to ignore them. For this reason, the system uses a combination of push and pull alerts. Push alerts such as telephone, fax, SMS, and email will deliver an initial alert with basic information on the occurring emergency and it will contain details of pull channels which are communicating methods that the public can access to be better informed such as a public dial-in number and websites.

APECS follows certain standards to ensure that the messages will reach the general public. They convey messages through low cost hardware that is accessible to

the general public. Different telecommunication carriers are used to ensure greater efficiency. Web-based applications are maintained to provide registered users and the general public with flexibility and independence of traditional methods. Finally, the latest security and encryption technologies are employed in order to stop any attempt of hacking *(APECS)*.

2.6.6.2.1 The Newsbug Trial

The foundations of APECS come from the Newsbug trial, an attempt in Western Australia to understand how new media can be used to reach the general public and improve community response, to establish a new service to save lives, and to explore new media communications infrastructure. The project resulted in the implementation of such methods as voicemail, fax, email, SMS, and webpage message channels to convey alert warnings. Some of the findings are presented in Table 1.

Table 1 Newsbug Trial Findings

Design Criteria	**Design solution**	**Findings**
Multiple channels	Delivery of messages via fax, website, email, voicemail, and SMS	The trial was successful
Residents of remote communities	Many of these communities have satellite televisions due to the lack of fixed-line networks	The capability to send messages via satellite television was established
Multiple senders	The system implemented a web service to allow different senders from different computers with internet connection	Messages were sent to the public successfully from multiple senders via web-based interfaces

2.6.6.3 Community Information and Warning System (CIWS) - Trial and Evaluation in Victoria

The CIWS trial is the first of its kind in Victoria to research and record the response of communities to a public emergency warning system that involves alert telephone calls with the public warning procedures and Graphic Interface System (GIS) mapping operations of Victoria's emergency services. The agencies and communities that worked in this trial an evaluation are the Office of the Emergency Services Commissioner (OESC), Telstra, ABC Radio, Department for Sustainability and Environment, Victoria's emergency services and the Shires of Yarra Ranges and Northern Grampians and their respective communities. The trail and evaluation started in October 2004, with the project being officially launched in May 2005 and a telephone alert message being sent to participants from May to September of 2007. All the data was collected by 2005.

The purpose of this trial and evaluation was to develop technology for the CIWS to map geographic areas in risk and send automated telephone messages to fixed landline telephones in the areas defined in the shortest time possible. The trial and evaluation involves two technology components and two social components. They are listed in

Table 2.

Table 2 Technology and Social Components

Component	Function
Technology Component Part One	Send automated information and warning messages to the communities involved
Social Component Part One	Engage in cooperation with the communities involved
Technology Component Part Two	Transfer of data between emergency sites and emergency operations center via Telstra
Social Component Part Two	Input from emergency services and communities to be used during the trial

The CIWS divided the response after the call in four different ways:

- It was directly received
- It was transferred to an answering machine
- It was connected but was not answered
- It could not connect

After the six trial telephone calls, the CIWS provided the participants with three other information sources: the telephone hotline, the radio station and the council website. A questionnaire was sent to the total 614 participants in the towns chosen, Mount Evelyn and Stawell, with a response rate of 82%. ABC radio station ranked first with 46% of responses mainly due to its convenience and ease of use. The telephone hotline followed with 44% of the responses, and the local council website and other information sources ranked fourth and fifth with 8% and 2%, respectively. It is important to notice that 54% of the respondents that used the hotline said they did not have troubles accessing it, while only 5% of them did have a problem. On the other

hand, 51% of the participants that used the main radio station (774 ABC) reported not having problems accessing it. However, a relatively high amount of participants, 20% reported that they have had problems accessing this source of information. The CIWS website was reported to not have accessibility problems by 18% of the participants, while 5% stated that they had difficulties accessing it. A large percentage of the respondents, 77%, reported to not have tried the website.

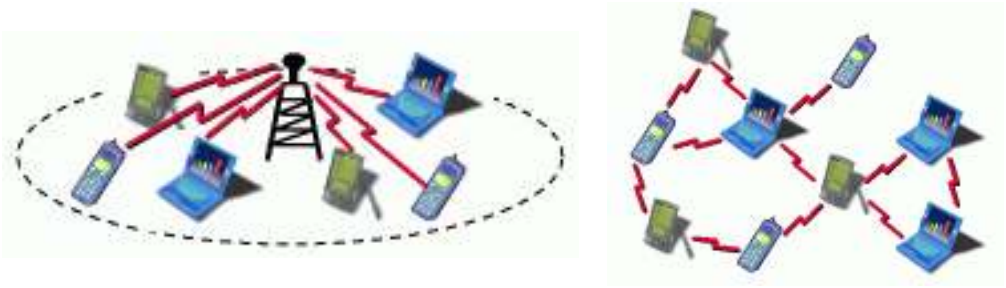
The purpose of using telecommunications technology to send automated delivery of warning messages to large numbers of participants was achieved successfully by CIWS. On a public risk communication level, the trial and evaluation found that "the decisions to prepare and plan a response to an emergency event were more likely to be influenced by both collective community activity and the emergency service agency's education campaigning on safety preparedness" *(CIWS)*. Most of the participants wanted to know information regarding the nature of the emergency, the level of threat and the actions needed. The integration of the radio and the website as informative resources after the automated phone call also proved successful *(CIWS)*.

2.6.7 Peer-to-Peer Networking

Peer-to-peer (p2p) networking is a technology that is defined to be growing with a rapid pace with the growth of the Internet. By definition a network is p2p "if the participants share a part of their own hardware resources. These shared resources are necessary to provide the Service and content offered by the network. They are accessible by other peers directly, without passing intermediary entities. The participants of such a network are thus resource providers as well as resource requestors" (*Schollmeier*). In other words, p2p networks allow the transfer of information among devices in already existing networks. The main characteristics of

p2p networks are that there is not one main server and there is no specific number of users, which allows for a decentralized manner of delivering information. That makes networks a cost effective method of data transmission (*Kulkarni-Interview*). One of the advantages of this type of networking is that it can reach people who are not connected to the Internet but are part of a local network. This allows for localized message distribution.

Another technology serving a similar purpose is called ad-hoc networking. Figure 16 Ad-hoc networks is a visual interpretation of the function of the ad-hoc network.



Infrastructure-based wireless network **Ad hoc network**

Figure 16 Ad-hoc networks

(Chong, Wee, Lian, Hui)

Similar to p2p networks, ad-hoc networks connect devices with a receiver and a transmitter in a decentralized manner by distributing information in the absence of fixed infrastructure (*Chong, Wee, Lian, Hui*).

This type of network protocol is also applicable to mobile phones. However, presently in Australia this service is still very expensive. Presently, according to an ACMA study, mobile broadband is not very spread among residential users, but is used

by business people (*ACMA*).

2.6.7.1 Applications

One of the most popular applications of p2p networks is file sharing. There are a number of p2p programs that allow file share within a group. Some of these programs are Napster, Kazaa, Limewire, and Bearshare. According to the ACMA study they run on one of four p2p protocols – Gnutella, FastTrack, eDonkey, and Freenet (*ACMA)*. These programs are used for file transfer among users in a particular network. The most popular characteristics of these programs has been that they are free and they gave users access to a wide range of music, videos and other files. However, many of these programs have become paid based services or shut down, due to legal and copyright issues.

2.6.7.1.1 Joost

One program that is scheduled to be released at the end of 2007 that uses p2p technology, is free, and does not appear to have legal problems is Joost. The makers of Kazaa and Napster are responsible for Joost's development. According to their official website "Joost is a new way of watching television on the Internet, which uses new and established technologies to provide the best of both the Internet and television worlds. We're in the process of making it as television-like as we can, with programmes, channels and adverts. You can also see some things that we think will enhance the television experience: searching for programmes and channels, for example, as well as social features like chat. There are many more new features to come in future Joost releases" (*Joost*).

2.6.7.1.2 Skype

Skype is a VoIP program that uses p2p networks. According to the official

website **"**Skype is a little piece of software that lets you make free calls to anyone else on Skype, anywhere in the world" (*Skype*).

2.6.7.1.3 YouTube

YouTube started in 2005 and is "the premier destination to watch and share original videos worldwide through a Web experience. YouTube allows people to easily upload and share video clips on www.YouTube.com and across the Internet through websites, mobile devices, blogs, and email" according to the program's official website (*YouTube)*.

2.6.7.1.4 Games in networks

Another application of p2p networks is in video games. Presently, many people in a network can play many games. This might or might not require an internet connection, but only a base server, to which the computers are directly linked. The relevancy of this to the project is that messages sent through one server can in a fast and cost effective manner reach a great number of users.

2.7 Technology Usage for Obtaining News

With all the new forms of technology available people are provided with various ways to access news and information. A Pew survey from the United States published in 2006 shows trends in technology usage to access news as seen in Figure 17. It is important to recognize that technology usage trends are characteristic of different age groups. There is a difference between what older and younger generations prefer when content is presented to them online, as seen in Figure 18 (*Pew*).

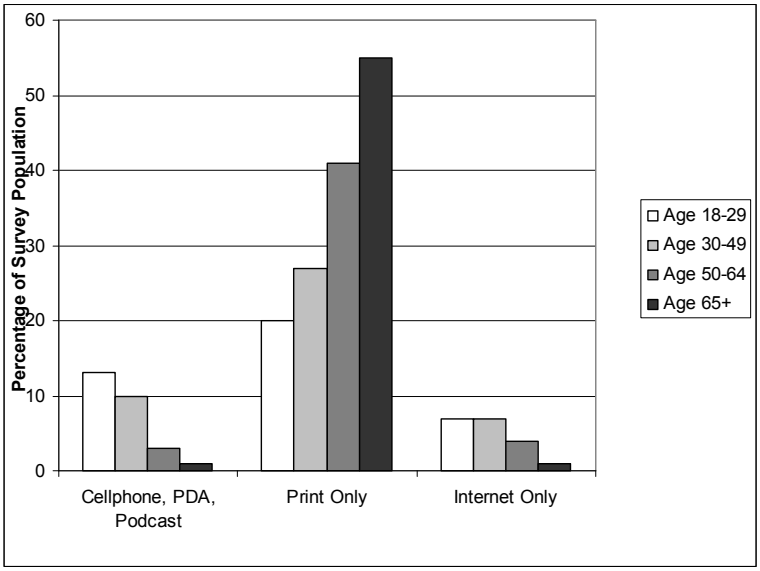


Figure 17 Methods of Accessing News

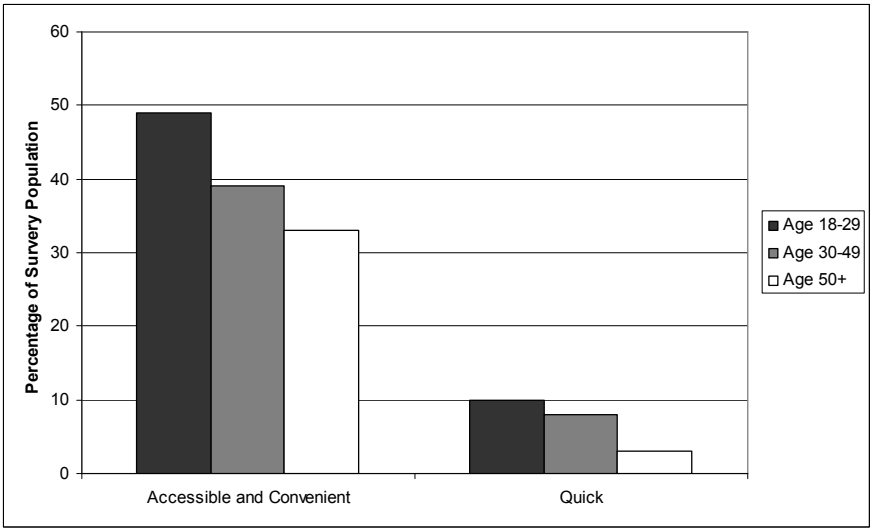


Figure 18 Necessary Elements of News

The figures show that the younger generation is indeed beginning to use new forms of technology for accessing news related information while the older generations are not. It is important to consider that these technologies are relatively new as the first Apple iPod was only released in 2001 (*Apple Press Release*). It has taken little time for iPods and internet-enabled mobile phones to become popular among the everyday

consumer. These numbers show that the younger generations are more apt to use new forms of technology. Therefore more messages might reach younger people if they are delivered through the newer methods of message delivery. The figures also show a difference between what older and younger people want from their news, with young people preferring quick convenient news.

Another survey published by Pew in 2007 found that there is a difference in the percentage of older and younger people that use different forms of technology as seen in Figure 19. There is a trend among young people to use newer forms of communication technologies, such as the Internet and text messages, more frequently than older people (*Pew*).

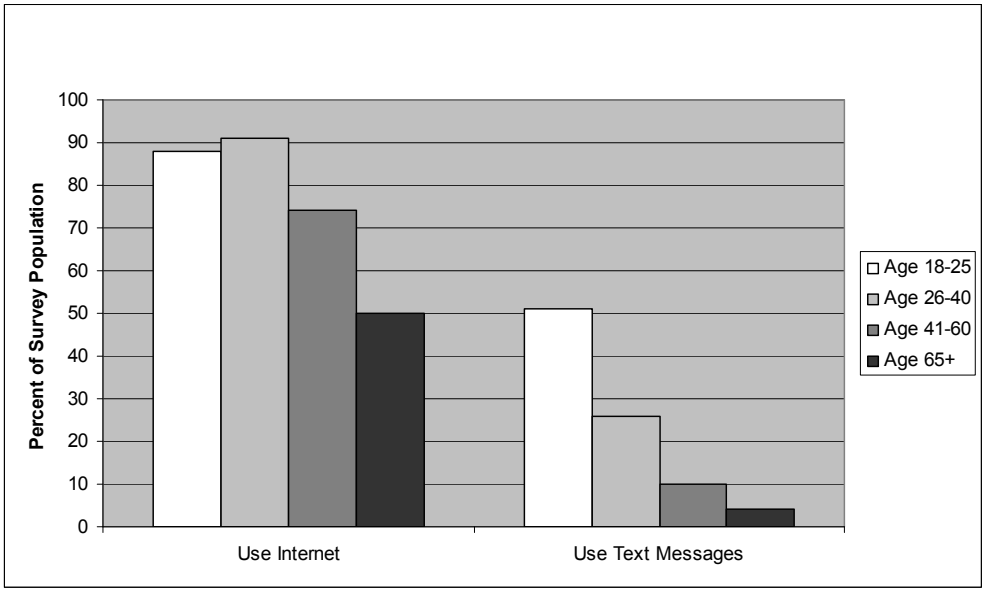


Figure 19 Technology Use

2.8 Future of Communication Technology

The last decade witnessed the appearance and development of new communication technology. Such cases can be exemplified by the advent of the Internet and its many uses, mobile phones, cable television, and video games among others.

These technologies revolutionized communication methods and markets and also enjoyed unprecedented growth. For example, 17% of Australian households had access to the Internet in 1996. This number rose to 30% in 2000 and 60% in 2006 (*ABS: Household use of Information Technology, Australia).* The percentage of mobile phone users in Australia increased from 44% in 2000 to 68% in 2004 (*ABS*). The growth rate for both mobile phones and Internet users has fallen to single digit numbers. However, many of the individual services and products of both technologies (i.e. search engines, mobile phone ring tones) are increasing in usage, pushing companies and users alike to innovate and steadily transform technology. These technologies are interesting because of their messaging capabilities, making them possible candidates for a research study on how to efficiently incorporate community safety messages. However, due to their constant innovation and their varied cycles in the market, future trends have to be determined.

2.8.1 Future of the Internet

According to the "Future of the Internet" survey described in the Pew Survey website, the Internet will impact the media industry where "connections across media, entertainment, advertising, and commerce will become stronger with the future margins going to new market players." Education will also be impacted with distant self-learning leading the educational transformation. Many other aspects of daily life will change and will be improved by the Internet (*Pew*).

The Internet will continue evolving in its technological capabilities. Connection speed is a key aspect of the Internet. Internet connection has gone from dial-up to broadband and wireless. Fiber optics will be the next step of improved internet connection. This technology permits digital data transmission over longer distances and

at higher data rates than other forms of wired and wireless communications. Fiber optics has a greater bandwidth than metal cables, and can thus carry more information. In addition fiber optics is less susceptible to interference. Within some time most forms of communication will rely on fiber optics (*Fiber Optics*). Overall, there is no doubt that the Internet will continue to unite more and more people.

2.8.2 Future of Mobile Phones

Mobile phones have evolved from bulky rectangular artifacts used only a decade ago into smaller than palm-size gadgets. Manufacturers and service providers are still transforming phone models, capabilities and services. Mobile television referred to as MobiTV is a fairly new implementation that transmits cable channels to mobile phones. MobiTV has approximately 30 carriers and over two million users (*Meyerson*). In late 2006 smart-phones began appearing in the market. Smart-phones are a full featured mobile phone with personal computer-like functionality. These types of mobile phones are capable of merging multimedia coverage with traditional calls (*Haskin*). Smart-phones are voice-centric devices meaning that voice is the primary function and data is secondary. Alternatively, PDAs such as Blackberry often include voice capabilities, but they are data-centric. A Pew survey reported that PDA usage among the general population increased from 5% in 2000 to 12% in 2006.

Furthermore, new technologies are emerging that further enhance mobile technology through the combination of several applications. The next device that will be available in the United States by the summer of 2007 is Apple's iPhone. As advertised by Apple, "The iPhone combines three amazing products — a revolutionary mobile phone, a widescreen iPod with touch controls, and a breakthrough Internet communications device with desktop-class email, web browsing, maps, and searching-

into one small and lightweight handheld device." Due to the rapid advancement in mobile technology, mobile devices might one day be able to replace computers and laptops.

The next generation of mobile technology, 4G, is already on its way. The development of 4G began in Japan in 2001 less than a year after 3G was released. Researchers are hoping that the 4G system can reach a much faster connection speed up to 100Mbps, tighter network security, and also increase the quality during communication for both voice and video calls. 4G mobile technology is anticipated to be available by 2010. This novel mobile technology will dominate the wireless communications, and its converged system will replace most conventional wireless infrastructure (*What is 3G?*).

2.8.3 Future of Video Games

Gaming consoles (e.g. Xbox, Playstation, and Nintendo) are increasing the complexity and visual capacity of games with each console generation that comes to the market (*Dolan*). Game designers are inhibited only by their creativity and available technology, therefore the computer and electronics industries will be responsible to push the limits of complexity of video games. The most notable future trends in the video game industry will be customization and the increased array of online gaming. Customization involves the active participation of the gamer creating his/her own game environment with interactive tools being developed by gaming and software companies. (*Dolan*).

In-game-messaging, particularly for online games, will have a promising future appearing in customization and online gaming networks. Video game players can create

and modify their environments, and converge in portals to communicate with each other. This is relevant to the project because by using communication portals, community safety messages can be delivered and could effectively reach the target audience.

2.9 Conclusion

The preliminary research examined the risk related to fire emergencies and the literature available on risk communication. It also looked at the community safety message delivery methods that are currently used in comparison to those forecasted to be used in the future. The findings provide a strong basis for the project. However, there are still aspects of the problem that were not addressed, thereby revealing the need for improvement. The background in combination with further research explained in Section 3: Methodology, assisted in the development of ideas for effective delivery methods.

3 Methodology

3.1 Introduction

The main goal of this project was to determine the technological delivery methods that are likely to be most effective for communicating public safety messages in the future. The literature review provided an overview of the existing information on the topics of technology, message delivery methods, and community safety in respect to different generations. Further research was necessary to provide the essential information that could not be found in the background research, as summarized in the Section 2. Research conducted in Australia allowed for direct contact with individuals and organizations that provided essential information for the project.

The outcomes of the methodology were as follows:

- Current communication technology usage among young people;
- Previous and current methods used by Australian organizations for the delivery of safety messages to young people;
- Types of communication technology most likely to be effective in providing safety messages that are effective at targeting young people;
- The projected future of communication technology.

The methods that the project team used were interviews, focus groups, and surveys. In order to determine what technological delivery methods would be effective with the target audience, young people 15 to 29 years old, it was relevant to understand their knowledge of safety messages, along with their preferences and usage of various communication technologies.

First, it was important to understand through what means people receive safety messages. The information was obtained via surveying university students from the Melbourne metropolitan area and conducting focus groups. The next step was to determine whether a technological delivery method would remain effective and if consumers would continue to use the technology. The methods used were interviews with technological experts and focus groups with young people.

The background provides an overview of what some organizations have used for community safety messaging. Through interviews with various fire and safety organizations the team discovered what problems organizations have encountered in their attempts to reach the target group. The interviews also investigated what organizations have researched or planned for the use of communication technology in the future.

In order to determine the most effective uses of communication technology, it was necessary to investigate the potential future of technology. A limited amount of

credible information was available on the new functionalities of existing technologies, in addition to new technologies under development. Interviews with technological experts provided a better understanding of the market and the future of technology.

Interviews were used as a tool to gather information from fire and technological experts. In addition to interviews, focus groups were used to acquire further insight and formulate ideas about the corresponding objectives. These methods were supported by a statistically significant survey among university students

3.2 Interviews

Interviews are a methodological approach of gathering verbal information that is not readily available in published literature. Interviews are also useful for discovering opinions and preferences about the organization or individual being interviewed. The knowledge acquired from the literature review is essential in the development of relevant and thoughtful questions. The following two questions must be addressed when selecting interview subjects; "What information is needed?," and "Who has that information?" For the purpose of this project, the interview subjects consisted of individuals and organizations involved in fire and public safety, and technological experts. The interviews followed a semi-structured format using a list of several open-ended questions.

Interviews with fire and safety organization were designed to obtain the following information:

- The interviewee's opinion regarding safety message delivery;
- The characteristics of effective messages;
- The methods organizations have used previously to communicate safety messages;
- Targeted audiences and reasons for specification of groups;
- Future goals organizations have for delivery methods.

Interviews with technological experts focused on communication technology in respect to:

- Purchasing information;
- Usage;
- Research and Development (R&D)

Table 3 represents a list of the interviews conducted. Information from the interviews is incorporated into Section 4.

Table 3 Fire and Safety Interviewees

Date	Company	Contact	Location
February 7, 2007	NFPA	James Shannon *CEO of NFPA*	Quincy, Massachusetts, United States
February 21, 2007	Firewise	John Hall *Assistant Vice President of Fire Analysis and Research*	Quincy, Massachusetts, United States
February 23, 2007	WPI	David Lucht *Professor and Director Emeritus WPI's Center for Firesafety Studies*	Worcester, Massachusetts, United States
March 16, 2007	Victoria AIDS Council Gay Mens Health Center	Asvin Phorugngam *Health Educator*	Melbourne, Australia
March 16, 2007	Bushfire Cooperative Research Center (CRC)	Richard Thornton *Research Director*	Melbourne, Australia
March 19, 2007	MFB	Rob Taylor *Executive Manager of Community Education*	Melbourne, Australia
March 20, 2007	CFA	Penny Wolf *Acting Manager of Community Development* Alan Rhodes *Manager of Community Safety Research and Evaluation*	Melbourne, Australia
March 26, 2007	Emergency Services Telecommunications Authority (ESTA)	Trevor Ives *Management Information Strategies Analyst*	Melbourne, Australia
March 27, 2007	Fire Emergency Services Authority	Karen Roberts *Executive Director of Community Development*	Melbourne, Australia
March 29, 2007	Metropolitan Fire Services	Amy Seppelt *Fire Engineer*	Queensland, Australia
March 30, 2007	ESTA	John Simmons *Computer Aided Design Review Project Officer*	Melbourne, Australia
April 11, 2007	Emergency Management Australia (EMA)	Christine Jenkinson & colleagues *Assistant Director of Knowledge Management*	Melbourne, Australia

Table 4 Technological Expert Interviewees

Date	Company	Contact	Location
February 21, 2007	WPI	Erwin Danneels *Associate Professor in the Management Department*	Worcester, Massachusetts, United States
March 19, 2007	National Information Communication Technology Association (NICTA)	Professor Thas Nirmalathas *Lab Director and Sensor Networks Program Leader*	Melbourne, Australia
March 20, 2007	NICTA	Renato Iannella *Researcher*	Queensland, Australia
March 21, 2007	Internet Development Australia (IDA)	Ewin Hill *Website Developer*	Melbourne, Australia
March 26, 2007	NICTA	Santosh Kulkarni *Researcher in the areas of peer-to-peer (P2P) networking and video streaming*	Queensland, Australia
April 5, 2007	Telstra	Allan Eades *Consultant for CIWS*	Melbourne, Australia
April 5, 2007	KPMG	Bernard Salt *Demographics Expert*	Melbourne, Australia

3.3 Focus Groups

A focus group is a form of qualitative research in which a group of people is asked about their attitude towards a product, service, concept, advertisement or idea. Questions are asked in an interactive group setting where participants are free to talk with other group members. Focus groups can help people to explore and clarify their views in ways that would be less easily accessible in a one-on-one interview (*Kitzinger*).

Seven focus groups were conducted in Australia to obtain information on topics relevant to the project such as fire safety, community safety messages, and technology usage among different age groups. The project focuses on educated young people 15 to

29 years old in Australia. Statistics have indicated that educated Australians are more likely to use the Internet; therefore educated young people were the primary concern and target of the project's research (*ABS, Household Use of Information Technology*).

Focus groups were conducted with young people 15 to 29 years old including university students and members and volunteers from fire organizations. The universities at which focus groups were held included the Royal Melbourne Institute of Technology (RMIT) and Swinburne University of Technology. These universities were selected due to the large size of their student body, thereby allowing a larger sample size. Members and volunteers from five fire organizations throughout New South Wales, Victoria and South Australia also participated in focus groups.

Technology usage and preferences of the target age group was determined based on feedback gathered from the focus groups. The focus group participants were asked a series of open-ended questions in a semi-structured interview format on defined topics, namely: community safety message awareness, behavioral change due to safety messages, use of technology with messaging capabilities (mobile phones, iPods, Internet, etc.), and the presence of messaging in these technologies. The goal was to encapsulate the participants' opinions based on interactions of the focus group. A summary of the conducted focus groups can be found in **Error! Reference source not found.**

Date	Focus Groups Participants	Age (years)	Number of Participants
March 22, 2007	NSWRFS Volunteer	23-28	6
March 22, 2007	NSWFB Firefighters	20-30	9

March 27, 2007	CFA Volunteer Juniors & Seniors – Macclesfield	15-19	4
April 3, 2007	CFA Volunteer Juniors & Seniors - Clematis	15-19	8
April 14, 2007	CFS Junior Volunteers- Adelaide South Australia	15-16	6
April 16, 2007	Swinburne University Students	20-28	5
April 17, 2007	RMIT University Students	17-20	6

Each focus group discussion was moderated by a member of the team. At least one additional team member was present to take notes and record the session. The focus groups were approximately one hour long.

3.4 Surveys

Surveys are an important way to determine the general preferences of the population. Using a survey as a tool to gather information about a specific group of people is a common way to learn about personal preferences with regards to different subjects. Surveys were useful for this particular project because helped to gain an understanding of what types of communication technology were commonly used by university students in the greater Melbourne area. The results from the surveys provided information about current and future use of communication technology. The results also gave insight into whether or not people use communication technologies to receive community safety messages. Lastly, the results provided information about the audience's awareness and perception of safety messages.

In order to achieve statistically representative data, it was important to gather information from a large enough sample size to accurately estimate the actual

preferences of university students. The survey subjects consisted of university students from five universities in Melbourne including RMIT, Melbourne University, Swinburne University, Australian Catholic University, and Monash University. One reason for conducting the survey among educated people was because statistics have shown that educated Australians are more likely to use the Internet (*ABS, Household Use of Information Technology*). According to ABS, in 2006 Melbourne's metropolitan area had a population of approximately 3.6 million people with about 23% of the population within the 15-29 year old age group (*ABS*: *Population by Age and Sex, ABS: Population Projections*). Therefore, there are approximately 830,000 people in Melbourne that are between the ages of 15 and 29 years old. This number represents a population greater than that of the university students in the greater Melbourne area.

According to Salant and Dillman, assuming a varied population (population with many opinions) with a 5% sampling error, 384 people would need to be surveyed in order to have a data set with 95% confidence. The sample population of the survey conducted consisted of 395 university students from Melbourne. This sample size was sufficient enough to cover all university students by default.

The surveys were gathered by visiting university campuses and handing out written surveys. The surveys were completed at the time of distribution and returned to the team members. The goal of gathering statistically representative data from a subset of the entire age group (15 to 29) was to determine the preferences of this specific group of people with respect to technology and safety messages. This group is important because it includes the middle portion of the entire target age group for the project, while also gathering information from educated respondents.

The surveys used in this project had a descriptive cross-sectional design, meaning the survey was designed to "seek to describe the distribution within a population of certain characteristics, attitudes, or experiences," and that data was gathered at one point in time (*Singleton*). The team conducted a test survey on the Worcester Polytechnic Institute campus in the United States. The purpose of conducting the test survey was to allow the team to gain experience designing and conducting surveys. Based on feedback from participants of the test survey modifications were made. A sample of the test survey can be found in Appendix C. The version of the survey that was used in Australia can be found in Appendix D.

The survey had several different question types. These included:

- Demographic information questions:
  These questions included age, gender, area where respondents grew up, and level of education.
- Open-ended questions:
  These questions allowed the survey participants to give any answer that they felt was relevant. The survey included a limited amount of these questions that were used only when further clarification was necessary.
- Closed-ended questions:
  These questions gave the participants a list of possible answers for a particular question. These questions consisted of a ranking system.
- Multi-level or filter questions:
  These questions allowed the survey participant to skip unnecessary questions based on responses to previous questions.

The surveys conducted in Australia consisted of twelve questions, in order to keep the attention of the respondents to the end of the survey. In order to obtain accurate results the team did not provide explanations to any of the survey questions.

The survey was used to investigate several different aspects of technology usage and awareness of safety messages among young people in Australia. The areas of investigation of the survey were as follows:

- Communication technology usage and preferences;
- Future use of communication technology;
- Current methods for receiving community safety messages;
- People's awareness of community safety messages;
- Behavioral changes after receiving a community safety message.

3.5 Timeline

The methods described in the past section were executed within March and May of 2007. Figure 20 represents the timeline for each of the methods that the team followed.

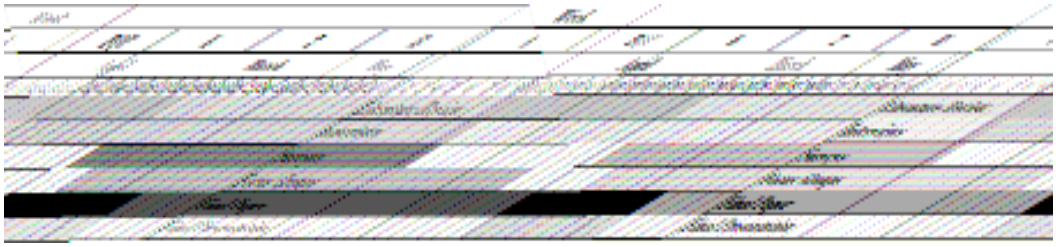


Figure 20 Timeline

3.6 Conclusion

By conducting interviews, focus groups, and surveys the team was able to gain ample information necessary for the completion of the project. The information enabled the team to understand the current trends in Australia with respect to communication technology usage and safety message awareness and delivery. Thorough analysis and evaluation was performed on the information gathered from the team's research. Recommendations for the effective delivery of community safety messages to the target age group were developed. The Findings and Recommendations can be found in Section 4.

4 Findings and Recommendations

Interviews, focus groups, and surveys discussed previously in Section 3 were the sources of primary research conducted for the project in Australia. The findings from these methods involve the following topics:

- Previous and current methods used by Australian organizations for the delivery of safety messages to the public;
- Current technology usage and the preferences of young people with respect to communication technology;
- The projected future of communication technology.

Section 4.1 Findings presents the findings from the team's interviews and focus groups followed by discussion and analysis of the survey results. The interview and focus group minutes can be found in the Appendix E. A copy of the survey conducted in Australia can be found in Appendix D. An in depth discussion is presented in Section 4.2 based on the literature review and the team's findings. Based on the literature review and the analysis of interviews, focus groups, and surveys, the team has identified a number of methods that could be used for the delivery of safety messages to the target group. Each of these ideas is evaluated using the SWOT Analysis technique which presents the strengths, weaknesses, opportunities and threats of each delivery method idea. Additionally, a Growth Share Matrix is used as a visual tool to describe availability, current usage, and prospect of growth for each technology. Finally, recommendations are made in Section 4.3 based on all information gathered. The recommendations provide a basis from which AFAC and its members can decide which ideas to pursue in the future.

4.1 Findings

The results from the interviews, focus groups, and survey are described in two sections. Section 4.1.1 Interviews and Focus Groups presents the findings from these

two methods. Section 4.1.2 is a description and analysis of data gathered from surveys.

4.1.1 Interviews and Focus Groups

The findings from interviews and focus groups are divided into sections based on the topics discussed during these meetings. Most of the topics are technology related, but the findings also include information about the target group and the message content.

4.1.1.1Targeting the Audience

Several of the fire organizations that were interviewed, although responsible for educating the public, are not particularly focused on the education of young people between the approximate ages of twelve to thirty for several reasons. Organizations target children starting in primary school and continue through year eight. Fire safety education is taught throughout the academic year in order to reinforce the information over time. Fire safety programs are also tailored to specific age groups, with more advanced information being used for older children. Organizations consider this information to be most effective when it is delivered repeatedly over time, especially throughout a child's early development years.

However, fire organizations still want to target young people throughout their higher education and beyond. According to CFA and MFB one of the reasons that young people are not targeted is because they are at low risk in terms of fire fatalities. Young people are more prone to drug or alcohol related problems than problems related to fire. Additionally, organizations not specifically limited to fire organizations such as the Victoria AIDS Council, have found it difficult to reach this age group. Within their teenage to early adult years many individuals tend to exhibit an attitude of invincibility.

According to focus groups, the target age group has a very similar attitude toward fire safety as they do toward the issue of skin cancer in Australia. Young people admitted they are aware of the risks associated with skin cancer but they tend to be relatively unconcerned. Similarly, young people in focus groups stated that fire safety is not a major concern for most young people due to the fact that many people in this age group do not have houses or families to protect, and do not have a high risk of death due to fire. Therefore young people do not see fire as an imminent threat.

It is also difficult to attract the attention of the target age group because they are exposed to large amounts of publicity and advertising. Safety messages specifically directed toward young people include those related to road safety, drugs, alcohol, smoking, drunk driving, and safe sex. According to demographics expert Bernard Salt such topics were not an issue for generations prior to Generation Y. Therefore Generation Y is bombarded with a high amount of messaging and advertising. Focus group participants within the target age group stated they are constantly bombarded with information, messages, and advertising.

4.1.1.2 Traditional Media

Traditional media includes television, radio, and printed media. These forms of communicating with the public are the predominant form of message delivery for both preventive and reactive messages. Their effectiveness is discussed in subsequent sections.

4.1.1.2.1 Television

Focus group responses revealed that television usage is more common among the upper portion of the target age group (25-29 year olds). A large majority of the

focus group participants under 24 years old stated that they watch television less now than they have in the previous years. Focus group participants claimed that in recent years the convenience and wide variety of services provided by the Internet has caused television to be used less. In regards to safety message delivery focus group participants stated that the majority of the safety messages they encounter are seen on television. Focus group discussion led to the conclusion that television is their preferred current method of message communication.

4.1.1.2.2 Radio

The radio is a popular form of entertainment for many people. Focus group participants listen to the radio when they are in the car, at home, and at work. Those focus group participants who have iPods listen to the radio less frequently. The newest forms of radio include internet and satellite radios. Internet radio is useful for many people because it allows them to listen to their favorite radio station whenever they have access to the Internet. According to focus group participants the radio is an effective method for providing community messages. Broadcasting over the radio is used for weather alerts, news, and traffic information. Several organizations such as CFA and Metropolitan Fire Services in Queensland (MFS) make use of radio broadcasting for emergency messages and alerts. Focus group participants concurred that the radio ranks the second most effective delivery method after television.

4.1.1.2.3 Printed Media

Printed media includes posters, newspapers, and pamphlets. It was acknowledged by focus group participants that visual messages capture people's attention significantly more than plain text. Several fire organizations use posters to present safety messages and make reference to their organizations. A commonly cited example for the use of visual messaging is diagrams of fire escape routes in public buildings. Focus group participants endorsed posters as a favorable delivery method for safety messages. Posters and visual media were deemed effective in public places where people are waiting or not performing some other task. Focus group members indicated that particularly effective locations are public transportation waiting areas and billboards.

4.1.1.3 Mobile Phones

Mobile phones are the newest method of message delivery considered by community safety organizations. Many of these organizations such as MFB, CIWS, and Western Australia Fire Emergency Services Authority are looking into or have already begun using mobile phones as a tool to deliver reactive messages, such as those that alert people about a fire.

Focus group participants agreed that it would be useful to receive reactive messages on their mobiles. These messages include fire status messages, fire ban and regulation updates, and other information relevant to current events in the community. Focus group participants indicated that messages should come from a credible source such as '000' (the Australian primary emergency service number) so they can be easily identified. Focus groups in rural areas prefer to receive messages that contain only text. Focus group members from metropolitan areas indicated that they would prefer to

receive visual information, such as a map, as well as text.

4.1.1.4 Internet

The Internet is currently being used by fire organizations to provide several different types of information including informative material, games for young children, and alerts for the general public. These organizations include MFB, CFA, and FESA. However, none of these organizations have investigated the use of the Internet to deliver messages specifically to the target age group of 15-29 year olds. Still, each of these organizations was interested in learning about the findings of this project in order to develop possible new programs in the future.

Interviews with communication technology companies and experts have helped to clarify information about the future of the Internet, especially with respect to the improvement of network availability. According to Allan Eades, a representative at Telstra, it is very likely that the Internet will be faster, more widely available, and have no limits on download amounts within the next ten years. The proposed improvements in internet capabilities will allow for larger streaming video files to be sent, which can be used as an effective delivery tool for sending messages in the future.

The Internet contains many different forms of advertising. One of the most well known forms of Internet advertising is internet popups. Focus group participants stated that they ignore and find ways to block popup messages from being displayed on their computers. Unsolicited emails (also known as 'spam') are also considered an invasion of privacy by the focus group members. It is also important to consider the type of ad being presented. Health educator Asvin Phorugngam as well as focus group participants indicated that short messages are most effective.

4.1.1.4.1 Instant Messaging

Instant messaging is a popular form of two-way communication via the Internet among young people. According to focus group participants the majority of young people in Australia use the client MSN messenger. Instant messaging provides a quick and easy way for people to connect with each other using the Internet. Focus group participants state that for the most part whenever they are using the Internet, they are instant messaging. In situations when applicable, instant messaging is preferred over emailing by the target age group. The idea of a fire safety instant messaging bot seemed to appeal to focus group participants. They liked the idea because the bot would be a non-intrusive method of providing the public with fire related information.

4.1.1.4.2 Virtual Communities

The Internet has many virtual communities that are popular among the target age group. Among these communities MySpace is the most widely used by young people in Australia according to the focus group members. MySpace is more popular among 15 to 18 year olds, who spend the most amount of time online communicating with their peers. According to focus group participants, virtual communities are used less frequently in rural areas due to limited availability of internet access. None of the organizations interviewed have considered the use of MySpace to send messages to young people. Discussion of MySpace fire message alerts with focus group participants suggested it might be a simple method worth looking into.

4.1.1.4.3 Video Games

Video games were a controversial subject among the focus group participants and interviewees. Focus group participants considered educational games to be boring, and that any sort of educational game would be most effective for young people below

the target age group. Focus group participants and fire organizations such as MFB also suggested that educational games would probably be most effective in an educational setting such as primary school. Focus group members stated that it is important to remember that the message must not be distorted in the game play as young children must be presented with correct information. There are also some popular video games that involve destruction and it was a concern among focus group members that these games are not sending the correct message.

In-game advertising is another form of communication, which was suggested by Santosh Kulkarni, a researcher for NICTA specializing in p2p and video streaming. This type of advertising can be a part of the game interface or a part of the storyline. In-game advertising is applicable in video games, as well as on mobile phone and online games.

4.1.1.4.4 Peer-to-Peer Programs

The p2p technology has great potential according to member of focus group participants. Sending messages in the p2p network of mobile phones will be more readily available in the future according to NICTA researchers. The existing and more widely used applications of p2p networks are p2p programs such as YouTube and Napster, as stated in Background. Some YouTube users with videos that are viewed by a wide audience are willing to post safety messages. According to focus group members, the use of such programs is currently limited due to the high bandwidth required. However, there is interest in programs like YouTube and Joost among the target audience.

4.1.1.5 Alert Systems

The use of alert systems has been discussed in focus groups. Feedback indicated

that focus group members would be willing to receive alert messages as long as they are relevant to them and are not intrusive. Some of the focus group members stated that they would not find an alert system useful, because they would be willing to receive informative messages only about major disasters that are happening directly around them

4.1.2 Survey Analysis

The survey was conducted in the state of Victoria during March and April of 2007. The universities where surveys were conducted were University of Melbourne, Monash University, RMIT, Swinburne University, and Australian Catholic University.

The survey consisted of three parts – demographic information, questions about communication technology, and questions about community safety messages.

4.1.2.1 Demographics

The sample demographics are presented in Table 5.

Table 5 Survey Demographics

Sample population	395 students
Age average	21 years old
Age range	15-29 years old
Percentage of male respondents	49%
Percentage of female respondents	51%

The survey respondents consisted of university students that fall within the 15 to 29 year old target group. Most of the students were currently pursuing Bachelor's

degrees. However, students pursuing higher degrees were also surveyed. This information is presented in Figure 21.

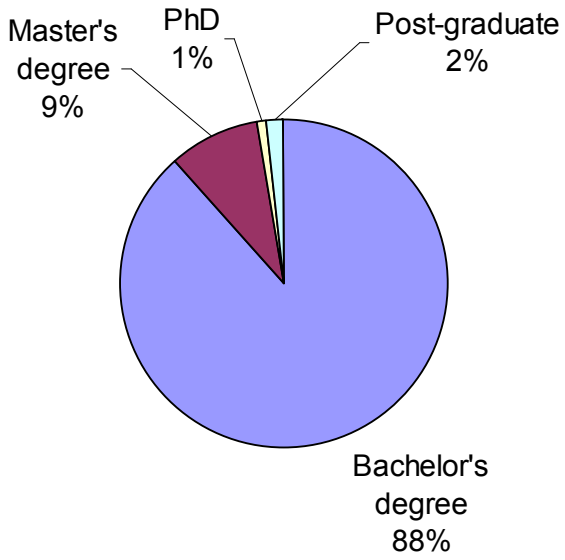


Figure 21 Survey Respondents Education

The majority of the university students surveyed grew up in a metropolitan area. Fifteen percent of the students were from a rural area, while 85% of them grew up in a metropolitan area. Figure 22 represents the particular breakdown.

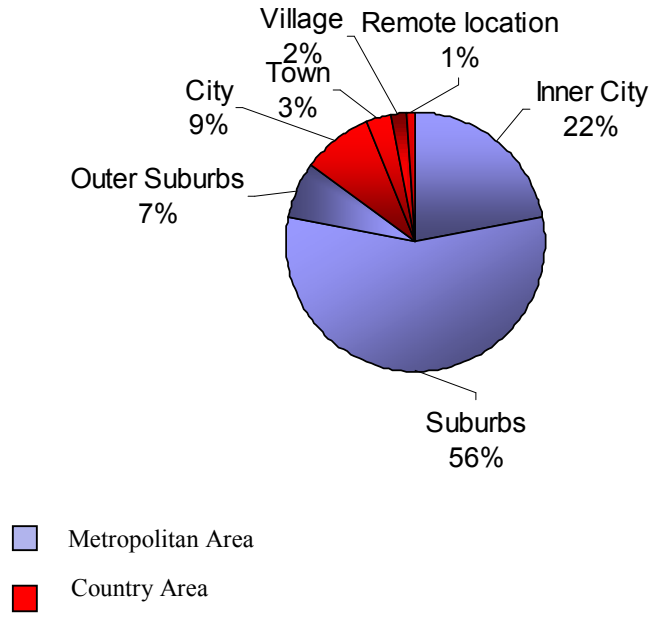


Figure 22 Metropolitan and Rural Areas

4.1.2.2 Communication Technology Questions

4.1.2.2.1 Question 1 – Device Usage

The first question in the survey asks the respondents for the number of times they use one-way and two-way communication devices as well as different activities incorporated in these devices. Figure 23 shows the collected data.

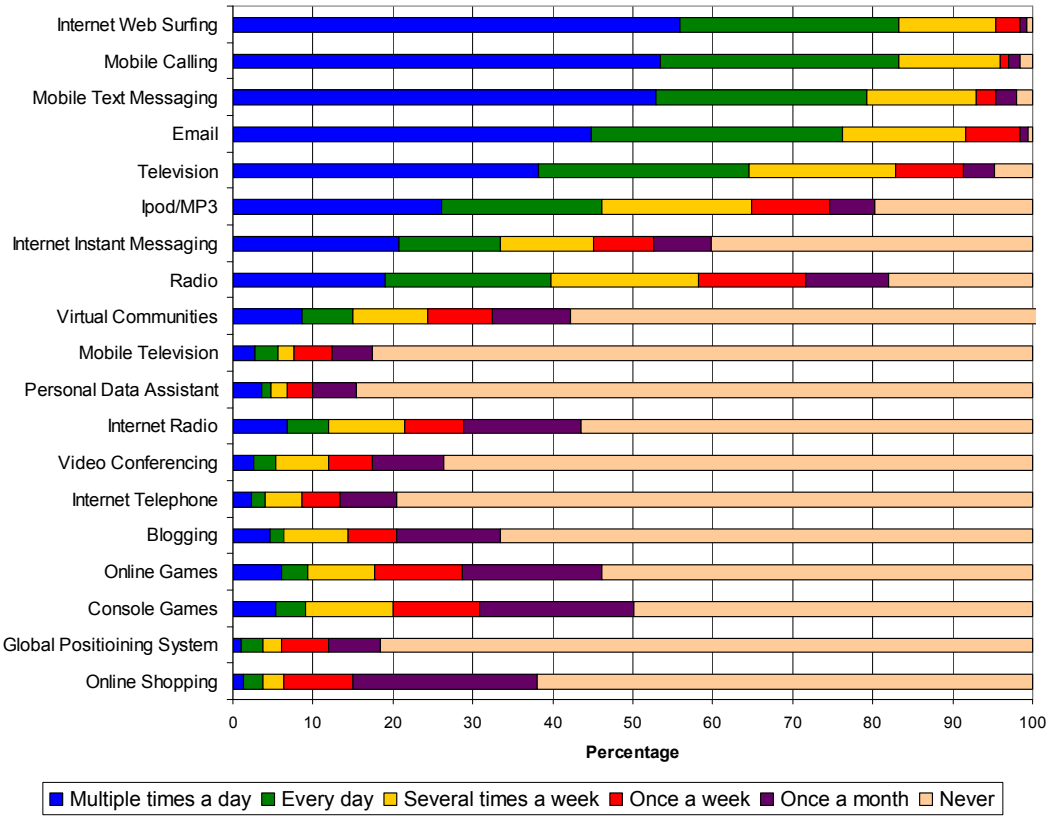


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Figure 23 Technology Usage by University Students

The different activities are sorted using the average response as the mathematical parameter. The average considered in this case was obtained from all the responses for each device used or activity performed. The items are presented in Figure 24 in decreasing average usage from top to bottom.

Several conclusions can be inferred from this graph. The items and activities with the highest usage on average are internet web surfing, mobile calling, mobile text messaging, and emailing, respectively. According to the survey, at least once a day 84% of the respondents web surf, 83% use mobiles for calling, 78% use text messaging

[2] In Figure 23 Virtual communities refer to the aggregate of Facebook and MySpace usage, even though there might be other programs that students use, which are not referred to in this survey.

and 76% send e-mails. The devices and tasks that are used or performed the least on average are mobile television, GPS, PDA, and internet telephone. These technologies have been introduced to the commercial market more recently than other devices such as television and mobile phones.

Traditional media (television and radio) are still widely used. However, it is Figure 24 interesting that television ranks fifth in average usage. iPods and other MP3 players usage is a recent social trend among university students. Forty six percent of the respondents reported that they use one of these devices at least once a day. The usage of iPods and MP3 players is higher than traditional radio usage, which is used by 39% of respondents at least once a day. Other activities with high usage rates among university students include Internet instant messaging, blogging, and MySpace.

The average usage was calculated for the entire data range for each device and activity, which included every ranking of usage from never to multiple times per day. In order to gain a better understanding of the average usage of a device or an activity, Figure 24 presents the average use for only those individuals who use the device or perform the activity at all, from once a month to multiple times per day.

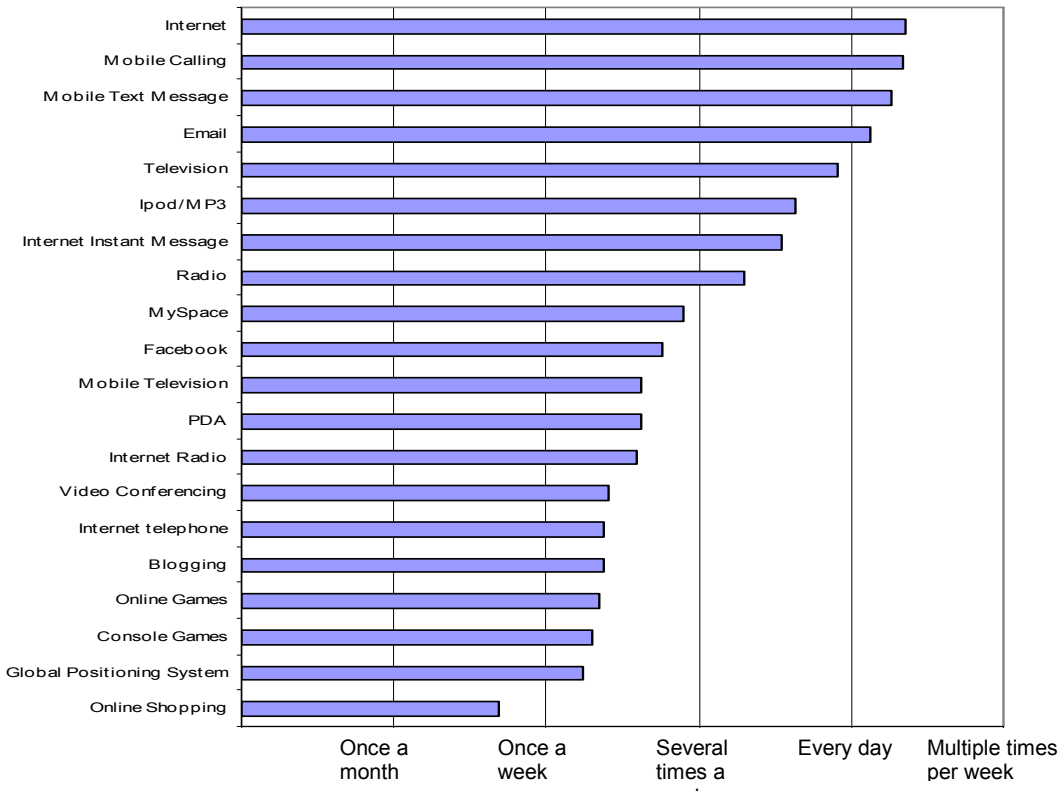

Figure 24 Device Average Usage

Internet web surfing, mobile calling, mobile text messaging, email, and television still rank as the most used activities. Each of these activities except for television, are used at least once every day. Although television and radio usage rank within the several times per week category, there is still a lower usage rate of radio as compared to television. Virtual communities such as MySpace and Facebook rank relatively high within the activity list, but still lower than Internet and text messaging.

Figure 25 sorts all the online activities that were included in the survey.

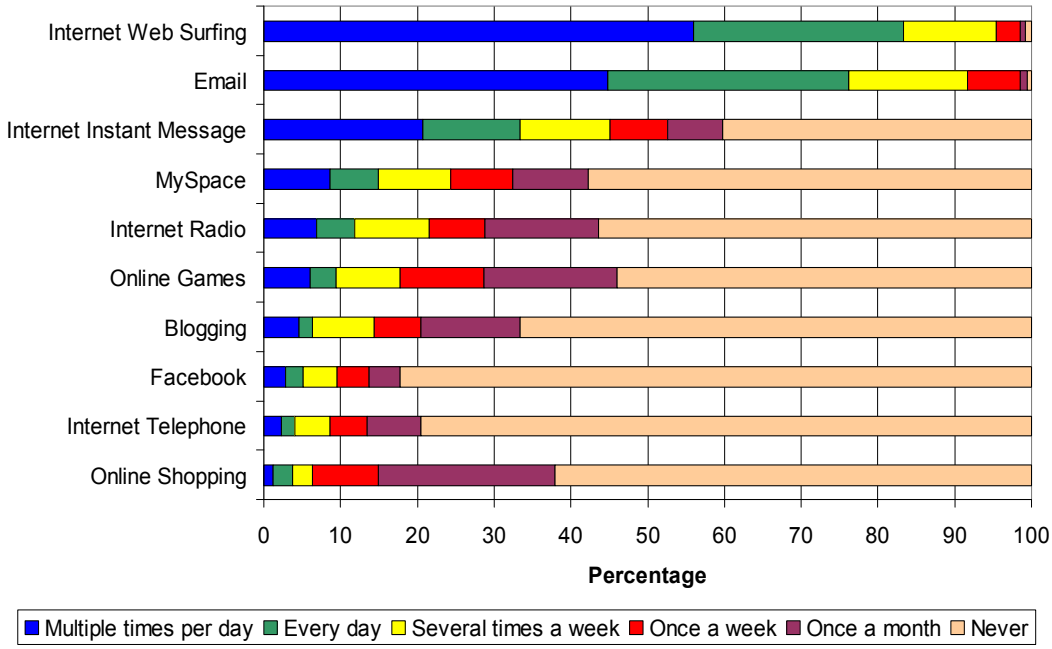

Figure 25 Online Device Usage

General web surfing, emailing, and internet instant messaging are the activities used most often. Facebook, internet telephone, and online shopping are used the least. This graph also shows a trend in one-way communication activities and two-way communication activities; the former connects a user with a specific content, while the latter connects the user to another person or to a larger community. Emailing, internet text messaging, and MySpace are two-way communication activities that rank higher than most one-way communication activities such as online games, blogging, online shopping and GPS. This is relevant because it implies that the target group spends more time over the Internet communicating with others than looking at specific content.

Figure 26 presents usage data for handheld devices and their functions.

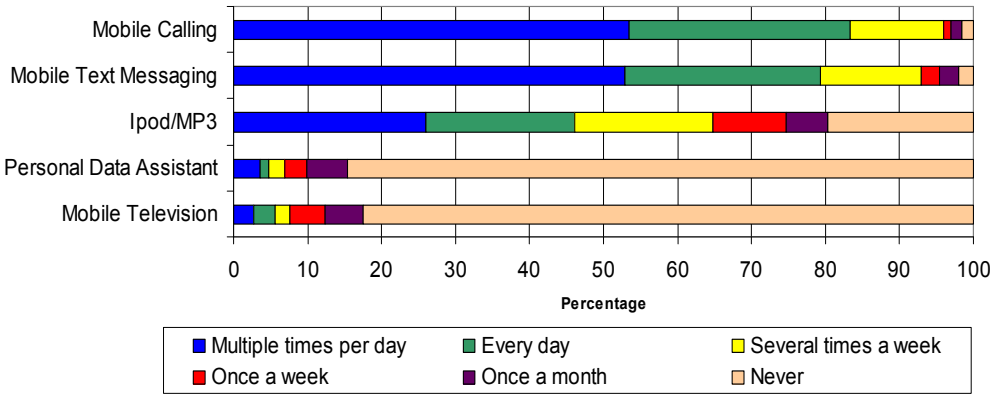

Figure 26 Handheld Device Usage

The same trend can be observed in this graph. The two-way communication activities of mobile calling and mobile text messaging rank higher than the one-way usage of Ipod/MP3, PDA, and mobile television. This shows that in respect to handheld devices the target group is currently more interested in communicating with others, rather than performing a non-communication task.

Figure 27 represents one-way activities mostly dedicated to entertainment.

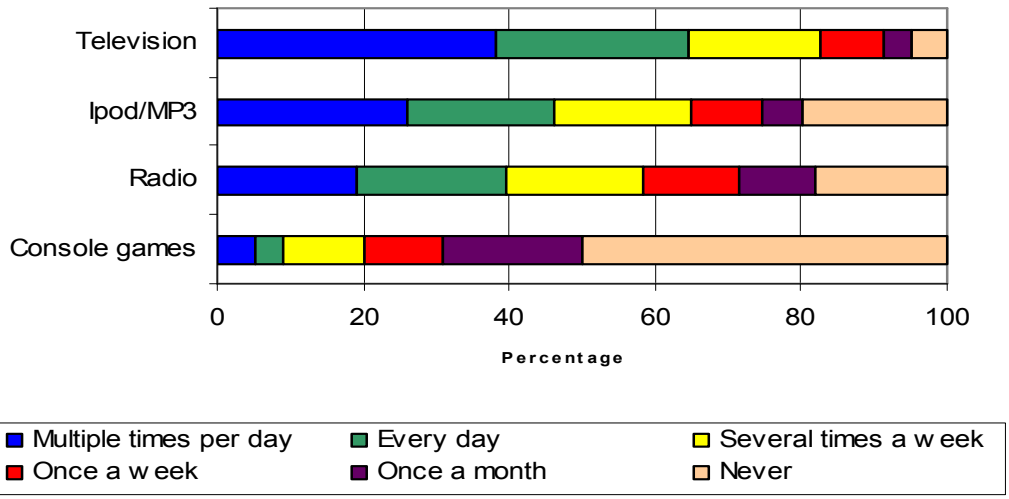

Figure 27 One-way Entertainment Devices

Television and radio have 65% and 39% of respondents that use them at least once per day. These one-way communication devices are forms of traditional media and their usage rates and numbers of users have been falling since the incorporation of new delivery methods like the Internet. However, they are still used frequently by the target group, especially when they are combined. Console games are not played very often by the target group, only 8% of the respondents reported to use them at least once per day and 50% of the respondents reported to never play console games.

4.1.2.2.2 Question 2- Instant Messaging

The second question of the survey was designed to determine what instant messaging programs university students use most frequently. Figure 28 represents the collected data.

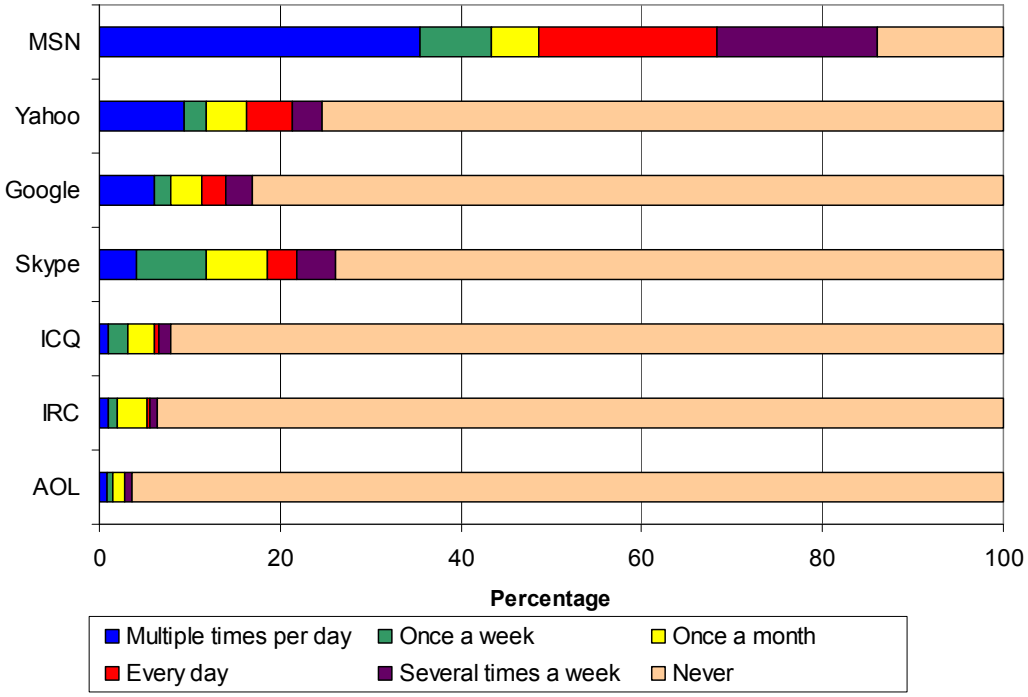

Figure 28 Instant Messaging Programs Usage

MSN messenger is the preferred software with 43% of respondents reporting to use it at least once every day and with only 15% of respondents reporting to never use it. Yahoo, Google, and Skype usage rank significantly lower than MSN usage with 75%, 83%, and 73% of respondents reporting that they never use these programs, respectively. Fourteen percent of the respondents do not use a messaging program, 60% of them use only one program, and 26% of them use multiple programs.

Skype is different from the other messaging programs in the sense that its primary purpose is voice communication over the Internet and as such requires more

bandwidth than the other programs. It is interesting that it is the most frequently used messaging program after the first three instant text messaging programs. Eight percent of the respondents reported to use Skype at least once per day, which could be due to the limited amount of bandwidth capability available in Australia.

4.1.2.2.3 Question 3 – Telecommunication Usage

The university students were surveyed regarding the communications companies that they subscribe to Figure 29 represents the collected data.

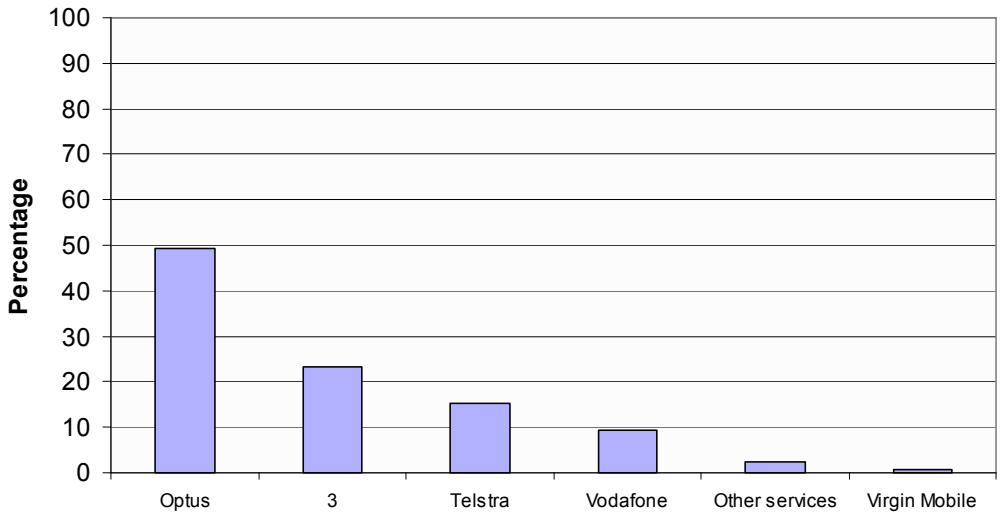

Figure 29 Communication Companies

Optus is the most widely used mobile service provider, used by 49% of the respondents followed by 3 (23%), Telstra (15%), and Vodafone (9%) Some of the respondents reported that they use more than one company. 15% of the respondents use two companies and 1% of them use three companies. The remaining 84% use only one company. This data indicates that the leading carrier is Australia, Telstra, ranks third among the target population. Also, messages must be delivered on more than one

provider to reach to greatest amount of people.

4.1.2.2.4 Question 4 – Internet Connection

The respondents were surveyed on the type of internet connection they currently have. Figure 30 represents the data collected.

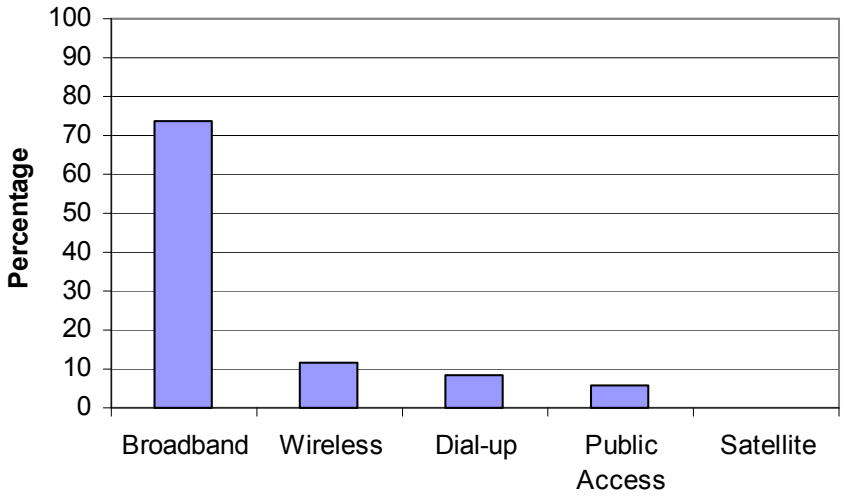

Figure 30 Internet Connection Types

Broadband is used by the largest percentage of respondents, 73%. Wireless and dial-up are used by 12% and 9% of the respondents, respectively. Public access internet, without specifying the type of connection, accounts for 6% of the survey responses. This information indicates that broadband is the most popular type of internet connection among survey respondents. This shows that university students may prefer a faster internet connection when using the Internet.

4.1.2.2.5 Question 5 – New Technology Purchases

The respondents were surveyed on the amount of time before they purchase a newly introduced communication device. Figure 31 represents the data collected.

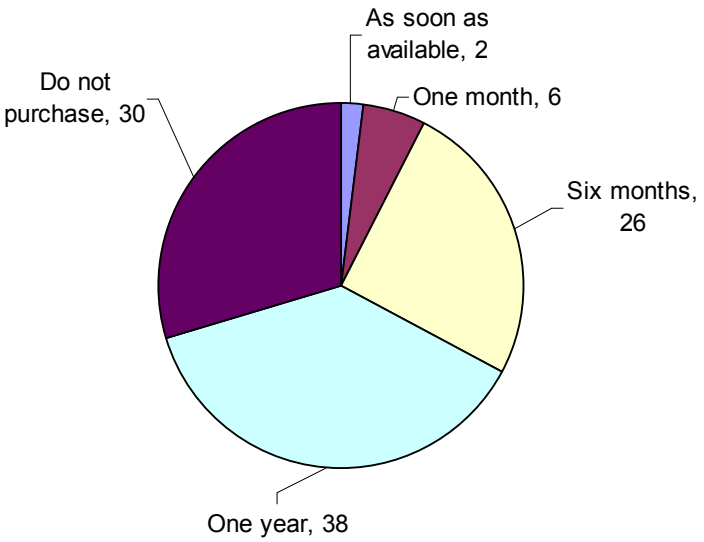

Figure 31 Time Period before Purchase

Eight percent of the respondents purchase a new device within the first month of its introduction to the market. This percentage is considerably lower than those who wait at least six months, which account for 63% of the responses. This indicates that new communication devices are not purchased by the majority of the target group within the first month, however 71% purchase a new device within the first year. One year is a relatively short time for a device to be purchased, which infers that young people are early adopters of technology. A large portion of young people could most likely be reached through devices that have recently been introduced into the market. Therefore, it is very important to develop safety messages that can be delivered via new technologies while they are popular and interesting.

4.1.2.2.6 Question 6 – Future Device Capability

The university students were surveyed regarding the functions they would like to see included on a device to be released in the future. Figure 32 represents the average

of the respondents' preferences for each function.

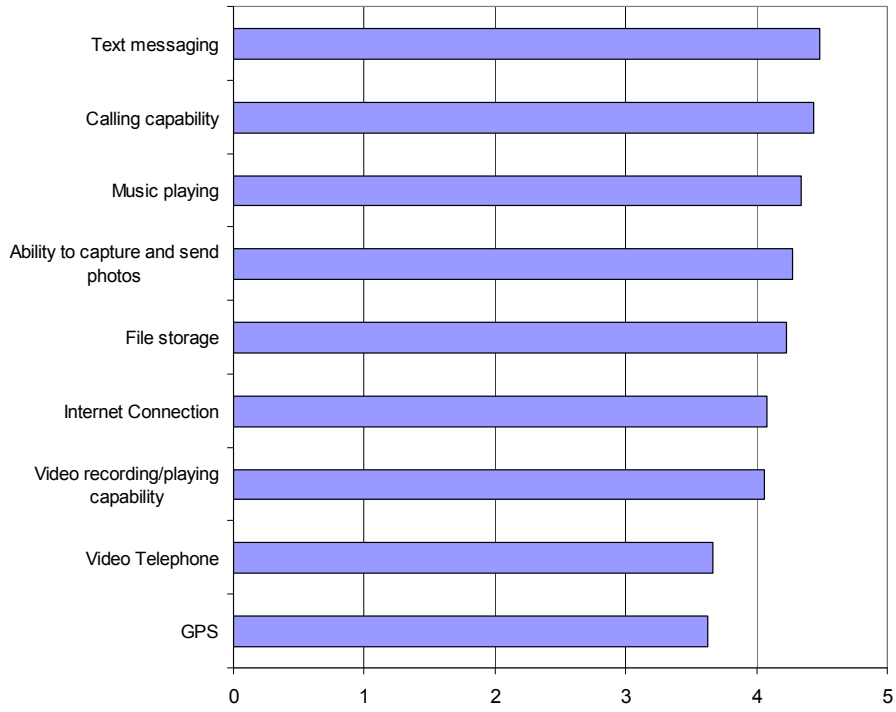

Figure 32 Device Capability Preferences

The two-way activities of text messaging and calling capability rank the highest, with music playing and the ability to send and receive pictures ranking third and fourth, respectively. This suggests a desire to keep using communication technology in the future with the main purpose of engaging in communication with others. However, there is also the desire to be entertained and this is something the respondents demand as a secondary use in the future for communication devices. Surprisingly, internet connection ranks sixth in the list. This can interpreted in the sense that although most respondents prefer devices for two-way communication, they will not necessarily use the Internet for this purpose. Video telephoning and GPS are the last two in the ranking list. One of the reasons for this is the early stage both of these technologies are in. Improved technology in the future, like 3G, will allow greater bandwidth and improved

usage of these technologies.

4.1.2.3 Community Safety Questions

4.1.2.3.1 Questions 7-9- Receiving Community Safety Messages

According to the survey 34% of the respondents have received a community safety message in the past six months. 71% of those who received a message remember the content of the message. The messages recalled included drunk driving, fire safety, cancer, home violence, drug use, speeding, smoking, and swim safety. This provides evidence that the target group is exposed to a wide variety of messages.

4.1.2.3.2 Question 10 –Delivery Methods to Receive Community Safety Messages

The university students were surveyed regarding the delivery method through which they received a community safety message. Figure 33 presents the data collected

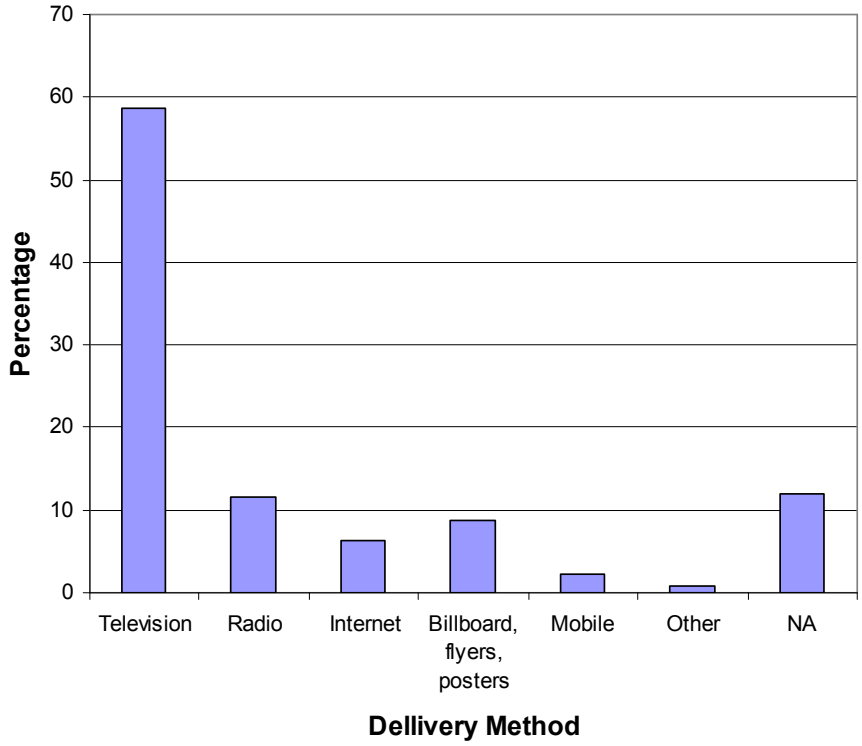

Figure 33 Medias for Receiving Safety Messages

Fifty-eight percent of the people that remembered receiving a safety message received it via television. Radio, billboards, and Internet followed distantly with 12%, 9% and 2% of responses, respectively. Only 2% of the respondents received it via mobile phone. It is interesting that while traditional media is ranked lower in terms of usage compared to other activities such as the Internet, it is currently the method that reaches the highest number of people. Internet and mobile phone activities were ranked very high in the previous graphs. However, the number of people that receive safety messages through them is very small. There is a great opportunity for growth if more safety messages are used in conjunction with these delivery methods because they are widely used by the target group.

4.1.2.3.3 Questions 11-12 – Message Effectiveness

The last two questions of the survey asked the respondents to rank their awareness of a topic before receiving a safety message and the efficacy in educating the person surveyed. Looking at these two questions together provides a better insight as to how effective safety messages are altogether. Figure 34 represents a bubble chart in which the x-axis represents how aware people were of the topic, and the y-axis, how successful the message was that they received. The size of the bubbles depends on the number of people who fit in the particular set.

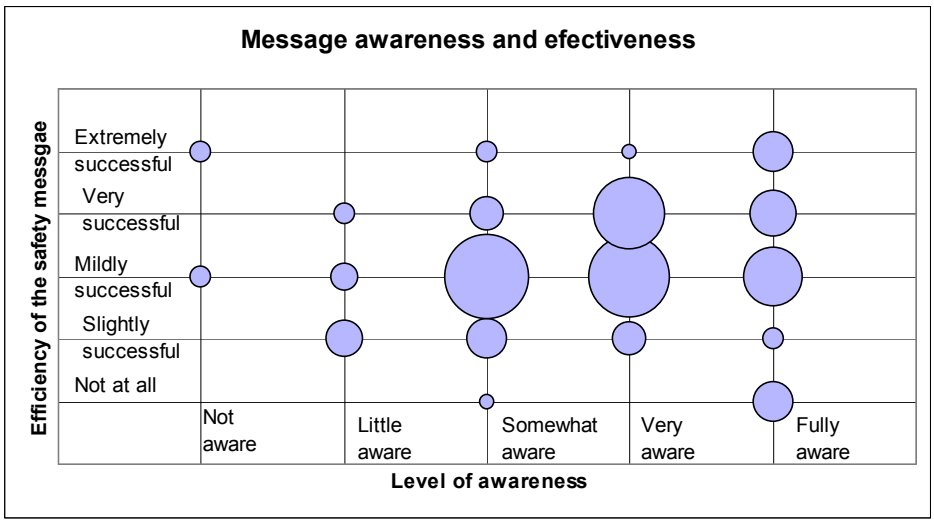

Figure 34 Message Awareness and Effectiveness

It is evident from the figure that very few people have indicated low awareness of problems. This implies that the majority of the people who remember receiving a safety message feel that they were aware of the topic. Of the people who were very aware about a topic, there are several who indicated that the message was very unsuccessful, which can be due to the fact that the person already knew enough about the topic. Overall, the majority of the people surveyed were moderately aware of the topic before they heard the message and it was moderately successful. For the purpose of this project this implies that the majority of messages are not extremely successful,

which implies a need for better messages content-wise.

4.1.2.4 Cross Tabulations

Cross tabulations (also knows as cross tabs) were conducted on different pairs of variables from different questions of the survey. They were used for the comparison between the frequency of usage of particular devices to one another or to the receiving of safety messages by the university students. The tables used for the cross tabs can be found in Appendix F.

Figure 35 represents the data gathered from the cross tabulation for the use of the virtual communities MySpace and Facebook.

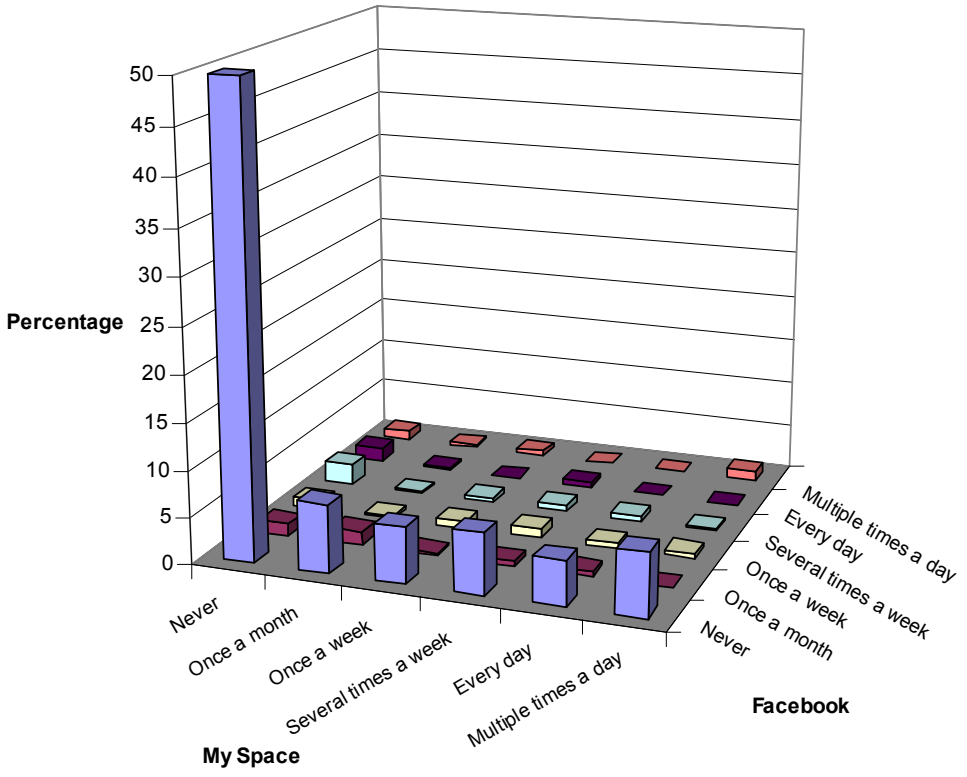

Figure 35 MySpace Facebook Cross tab

It is visible from the figure that the number of people that never use any of the

virtual community programs is higher than any of the other numbers. This group accounts for 50% of the survey responses. However, the number of people that never use only Facebook is higher than the number of people that never use only MySpace. This indicates that MySpace is the virtual community of choice by the target group.

Figure 36 represents the data for the mobile calling and mobile text messaging cross tabulation.

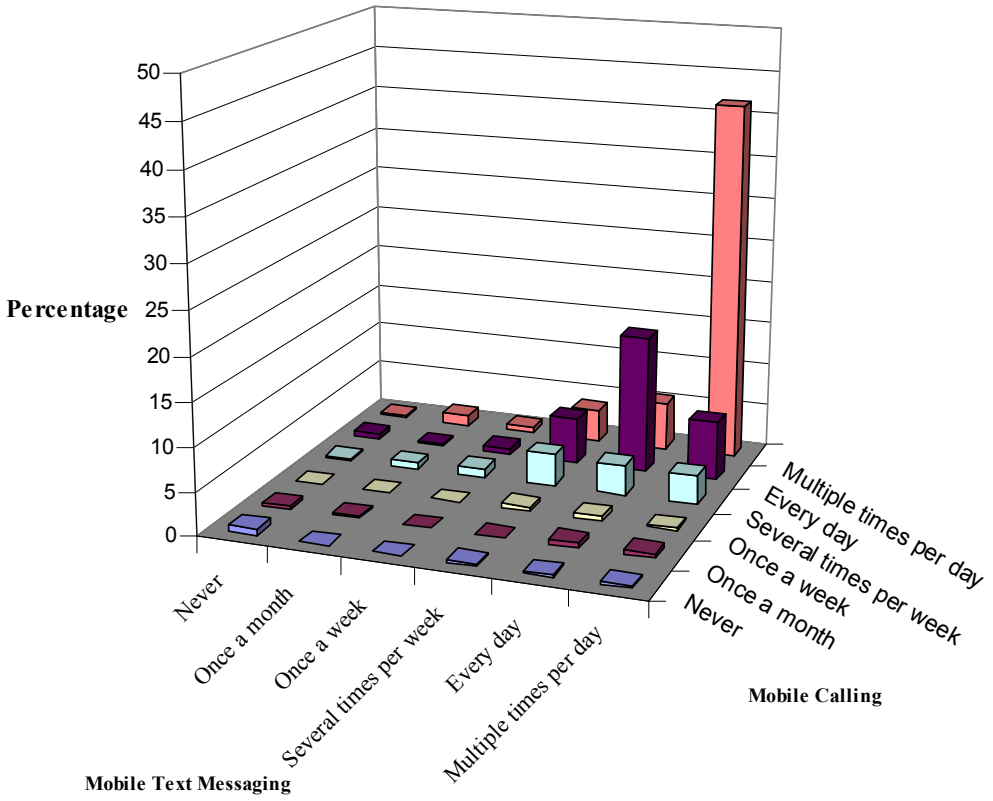

Figure 36 Mobile Text Messaging and Calling Cross Tab

Mobile calling and mobile text messaging are both frequently used by the target age group, but what is most important is that the relation for multiple times per day for these two variables is greater than any other combination. In general frequent users of

mobile calling are frequent users of mobile texting and vice versa. Also, none of these two activities is preferred more than the other according to the survey responses.

Figure 37 represents the data for traditional media, the aggregate of television and radio, and the respondents that have or have not received a community safety message in the past six months.

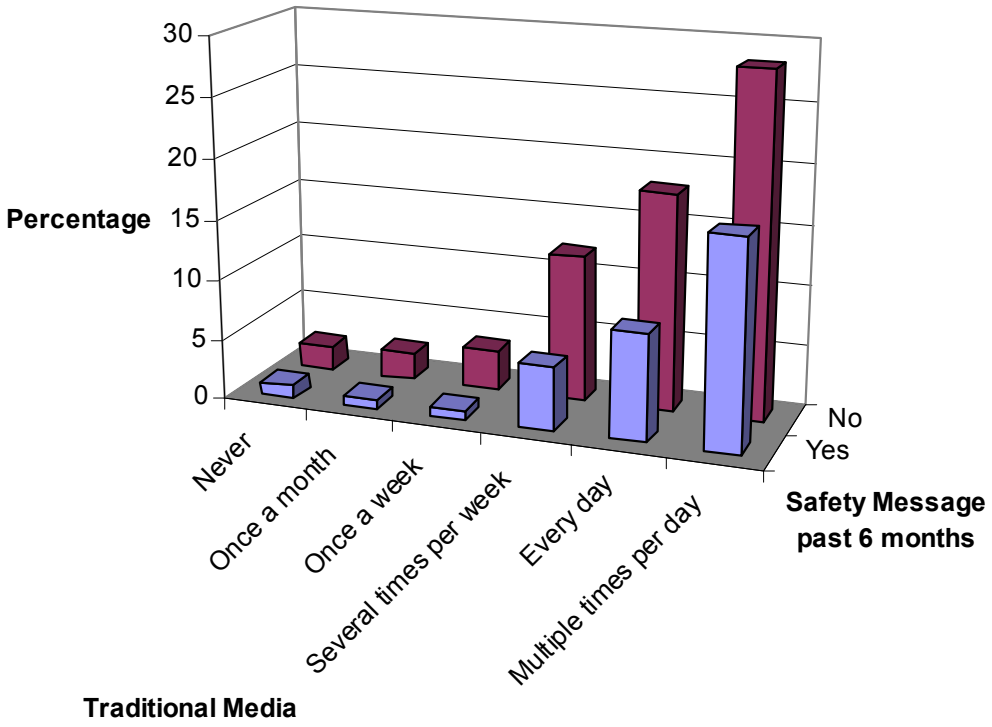

Figure 37 Traditional Media Safety Message Receiving Cross Tab

It can be observed that the use of traditional media does not strongly affect the number of people that receive safety messages. This implies that irrespective of the usage frequency of traditional media, there are fewer people receiving safety messages overall. For example, twenty eight percent of the survey respondents use a traditional media multiple times per day and have not received a safety messages, compared to 17%, who also use traditional media multiple times per day and have received a safety

message.

In addition, it is also useful to compare the ratio of people who have received a safety message to the total amount of people that have or have not received a safety message for a particular frequency of usage. Figure 38 represents this information.

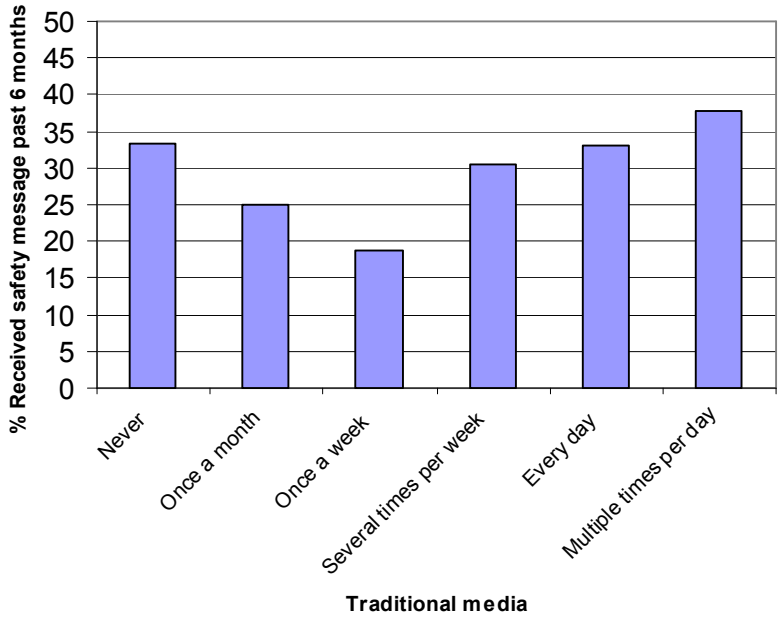

Figure 38 Media Usage vs Message Receiving

The graph shows that more respondents that never use traditional media have received safety messages than those that use it once a month, once a week, or several times per week. This indicates that safety messages are also available via different delivery methods. Also, there is not a clearly defined trend indicating that the higher the usage of traditional media, the higher the number of people who receive a message.

4.2 Discussion and Analysis

4.2.1 Discussion by topic

4.2.1.1 Traditional Media

4.2.1.1.1 Television

Decreased television usage among the target age group was acknowledged in the background Section 2.6.1. Focus group discussion provided confirmation of this trend. The television is useful in providing access to the news and various programs for entertainment. According to focus group participants, leisure time previously spent watching television is now being consumed by time spent online. There are several compelling reasons for this transition. In comparison to the Internet, the entertainment and usefulness provided by the television is very limited. The Internet enables users to have access to multiple services and perform several tasks simultaneously. Multitasking is quite common and effective for many people while on the Internet. Such activities include emailing, instant messaging, shopping online, websurfing, watching television programs, and listening to music. The television set per se, is not as appealing because it only offers a solitary service. Overall, the Internet is far more interactive than the television. According to the survey, 64% of university students watch television on a daily basis while 83% of university students use the Internet daily.

Despite its decreased popularity among the target age group within the recent years, television is still the media through which messages are most often received by the target group. It is important to consider the fact that there are only a few methods of delivering safety messages currently employed. These methods include the television, radio, internet websites, and printed media. Fifty eight percent of the surveyed university students, who stated that they remember receiving a message in the past six

months, indicated that they saw it on the television. Safety messages seen on television specifically related to fire include preventative messages played during commercials and reactive messages seen on the news alerting people of wildfires, fire bans, and fire restrictions. Focus group members agreed that fire safety messages on television involving reality like examples of fire disasters and messages that are graphic, to a reasonable extent, would be most effective. An "in-your-face" type of message is often necessary in order to grab attention and have an impact on the target age group. The major hindrance to the effectiveness of television messaging is people's negligence regarding commercials. During commercials people tend to get up and perform other tasks, mute the television, talk to people around them, or switch the channel. An idea to help avoid this problem would be to play a safety message in the middle of a show. The message would have to be short, less than twenty seconds, and unexpected. Presenting a safety message in this manner would make the message unavoidable by the viewer.

Even though 58% of the university students who have received a message were reached through television, this does not mean that television is an effective delivery method. In reality only 20% of the surveyed population has received the message via television. The relatively low number implies that the current delivery methods are not sufficient enough in educating the target age group.

4.2.1.1.2 Radio

Both focus groups and survey respondents ranked the radio as the second most commonly used method of message delivery. Twelve percent of university students have heard a safety message over the radio in the past six months. Within recent years satellite and internet radios have become popular. Many radio stations have live radio streams on their websites so users can listen while they are online. Internet radio thus

helps to increase the number of radio listeners. On the other hand satellite radio provides an alternative type of radio. Satellite radio systems are available for mobile vehicles, home stereos, and on the Internet. Satellite radio contains a limited amount of advertising, if any, and is a subscription-based service, thus it is preferred by people for this reason. Reactive messaging cannot be applied to satellite radio broadcasting because many satellite radios transmit service over vast regions including those nationwide. Preventive messages are considered a form of advertising and thus are not currently allowed on satellite radio.

Safety messages can however be combined with live radio streams and satellite radios accessed via the Internet. Incorporation could include having the user view a safety message prior to granting them access to the radio.

4.2.1.1.3 Printed Media

Printed media is a widespread form of communication. Printed media accounts for 9% of the safety messages that were seen in the past six months. Focus group participants supported the use of printed media because it is not an intrusive method of message delivery. Printed media presents the message so it is there if people choose to read it. Printed media is most effective as a visual distraction in public places where people are unoccupied or waiting. Posters and advertisements are the most commonly recognized types of printed media for safety messages. According to Asvin Phorugngam, the messages displayed on posters and ads needs to be short and to the point otherwise people will not bother to read them. A combination of an image and short statement is usually the most effective presentation for a message on a poster or an ad. Some of the suggestions from focus group members about where printed media could be used are public transportation vehicles and stations, waiting rooms, movie

theaters, classrooms, public toilets, and others.

Printed media is considered a non-technological communication method. However it is still a highly useful method of providing preventive messages to the public. The disadvantage of printed media is that it can only be utilized for the conveyance of preventative messages. Regardless of all the technological advancements the use of non-technological printed media messaging is likely to remain an effective and indispensable messaging method.

4.2.1.2 Mobile Phones

Mobile phones are a popular device used for communication, with 83% of survey respondents using mobile phones at least once a day for calling, and 79% for text messaging. The portability and multiple uses for the mobile phone are features that make this device attractive to young people. In fact, some of the focus group participants said that they do not have a wired home phone, and that they only subscribe to a mobile phone service. Some mobile phones also have the capabilities to store and play music, access the Internet, and watch streaming video. Phones with these extra features are becoming more prevalent as new models are released and the networks are improved. With the switch from older CDMA networks to new 3G networks, there is a great possibility that many phones will be capable of receiving and displaying greater amounts of internet material and streaming media then ever before according to Allan Eades. PDA capabilities are increasingly being incorporated into mobile phones *(Iannella)*. This is relevant because they are widely popular among young professionals, therefore can be used as a delivery method to this age group.

Although mobile phone technology is continuously improving, there are many

people that do not want to receive messages on the phone regarding community safety. Many focus group participants said that they would not like to see any picture or video messages sent to their phone, especially the people in rural areas with only limited network access. Still, the participants believed reactive messages would be very important, as long as they came from a credible source and conveyed a message that was important for the moment, such as the location of a fire. People were also interested in learning about different aspects of community safety regulations, such as current fire ban information. Still, any sort of preventive message would most likely be seen as intrusive since many people like to have their mobiles free of spam, according to the focus group members.

There are many ideas for using mobile phones to deliver safety messages in the future. For preventive messages, there could be a free downloadable fire safety game, or free games, backgrounds, or ring tones for people that watch a short safety video or fill out a safety questionnaire. For reactive messages, there are already some services that exist in different parts of Australia that alert people of a fire. These services can be opt-in, meaning that people sign up for the service to be notified when there is a fire in a particular area. Services such as these could be expanded to cover every area of Australia where people reside. Also, the messages could be sent to all mobile phones that are working from a tower within the affected area. This way, all people that are in a potentially dangerous area would have the time to find their way out. Another possibility is to send a general emergency warning message, and then allow the recipient to become actively involved in the situation by going to find his or her own information through whichever means they see fit. Still, the messages must be from a credible source such as “000” so that people will realize that it is not a prank. It is

highly important that there is no way for an outside user to send a message from the same number or with the same title. Also, the number of messages sent should be kept to a minimum. A possible improvement to the mobile phones itself would be to add a small light that blinks when there is an emergency.

The most popular mobile phone carrier among survey respondents is Optus, followed by 3, and then Telstra. This information is useful because information sent to Optus mobile phones would reach the greatest number of people in the target age group. However, it would still be important to send messages on all networks in order to reach the maximum amount of people.

4.2.1.3 Internet

The Internet is a widely used form of communication that is used by people today. With everything from games to shopping to online chats, people are using the Internet more than ever before. In fact, 99% of the university students said that they use the Internet, and 83% of the survey respondents use it at least once a day. These numbers show that Internet is a very popular form of communication among the younger generations.

One of the drawbacks to using the Internet as a message delivery tool is the lack of download capability for current internet users, according to Santosh Kulkarni. With slow network connections and restrictions on download amounts, many people cannot use the Internet for anything that requires fast speed or large file downloading capabilities. Still, the future of the Internet is promising for all customers. With the fiber optic network that is expected to be installed throughout the country, internet functionalities have the potential of dramatically improving within the next ten years,

according to Telstra representative Allan Eades. These network improvements include faster network connections, greater coverage area, and unlimited download and upload capabilities. When this unrestricted Internet becomes available for the majority of the population, it will be important to utilize the new features as much as possible. Without download limits and slow connections, people may be more likely to download videos, pictures, and other media that they may have otherwise ignored because of the file size or time to download.

The uses for the Internet as a message delivery system are almost endless. In the case of preventive messages, ads can be placed in strategic places on different websites. Ads that open automatically with another website are known as popups. Popups are disliked among the majority of people that participated in focus groups. Programs exist that block popups from displaying, thereby making any possible popups useless. Overall, popups are disliked, ignored, seen as a nuisance, and are a bad idea for effective message delivery.

There are other types of advertising that may be more effective for messaging to the younger generations, as discussed with Santosh Kulkarni. First are direct advertisements that show a message directly to the viewer. These ads include things such as pictures, videos, and simple games that can be found in certain web pages. The goal of these ads is to gain the attention of the viewer by either visual or audio means and relay information about a particular topic. The other type of ad is an indirect ad, such as links to other websites. Indirect ads can be useful because they can direct the person to an outside source of information such as a newspaper or community safety website with in-depth and up to date information. Indirect advertising may be particularly useful because the target age group prefers to be a part of the solution,

instead of just receiving the information directly. Having to follow a link satisfies this need.

Email is used by many young people today, with 99% of survey respondents using email. Although email is a popular communication tool, using this method to deliver safety messages was discouraged by focus groups participants for two reasons. First, people would see preventive messages as spam and many of the unsolicited emails would be treated as junk and deleted. Secondly, sending reactive messages via email would be useless to many people because the recipient would have to be at the computer and online at the time of message delivery in order to receive timely information.

Another possible use of the Internet for safety message delivery involves using an incentive program for viewing safety messages. There are many websites that allow people to listen to internet radio and watch television shows online. Some of these websites have sponsored commercials that play before and during the music or television show. Another option would be to provide free downloads to people who complete a safety survey. For example, there could be a short video with fire safety information and a short survey at the end about the content of the message. If the person watches the video and answers the question correctly, then they could receive a free music download of their choice. This would require a partnership between the organization delivering the message and a music download company, but it is an idea that might attract the attention of young people. Many young people like to receive things for free and spending a few minutes viewing a safety video is a small price to pay for free music downloads.

4.2.1.3.1 Instant Messaging

Instant messaging programs are popular among young people because they provide means by which individuals can communicate with their peers while at the same time using the Internet for other tasks. Instant messaging is a form of two-way communication that allows for multiple two-way conversations to occur at once. Instant messaging is an extensively used method of communication among the target age group, as only 15% of the survey respondents reported that they do not use any form of instant messaging at all. According to both focus group participants and the survey data, MSN instant messenger is the most widely used instant messaging client. Forty-three percent of the survey population use MSN messenger on a daily basis. Yahoo, Google, and Skype in that order, are the other three most frequently used instant messaging programs that are popular among young people in Australia.

The client Skype is different from other instant messaging programs in that it has an additional subscription-based calling feature that allows user to make calls to one or more recipients via the Internet. As per the survey, 26% of the respondents report that they use Skype with 8% using the client on a daily basis. This indicated that Skype is not a regularly used form of communication among the target age group. Current internet limitations regarding area coverage, connection speed, transfer rate, and download size restrictions could explain the low usage. With the expectation of improved Internet in the upcoming years it is likely that instant messaging programs and their accompanying functions will be increasingly utilized.

Due to the high usage among the target age group, instant messaging programs should be taken into consideration as a mean of message delivery. Safety messages can

be incorporated into the display of a user's contact list or instant message (IM) windows. Messages that occur in the user's contact list can include text, images, animation, video and sound which would be useful in attracting the attention of users. The development of a fire safety bot for instant messaging programs is another way to encompass fire safety into instant messaging programs. A fire safety bot could be programmed to provide information and tips regarding fire safety. Bots could be designed for specific areas of Australia and programmed to send IM's to all user who have added the bot on their contact list to alert users of fire safety bans, restrictions and the occurrence of major bushfires.

4.2.1.3.2 Virtual Communities

MySpace is the most popular virtual community among young people in Australia. According to the survey MySpace is used by 15% of the survey population on a daily basis. There are no forms of safety messages that utilize MySpace or other virtual communities. However, the use of MySpace messaging to alert people of wildfires appealed to many of the younger people in the target age group as an acceptable delivery method. A message notifying people within a certain area of an occurring fire or a fire map displaying the location of wildfires would be useful. It was pointed out that MySpace users would only want to receive fire alerts that are relevant to their location. Providing messages relevant to a user's location would not be an issue because when users register for MySpace they are given the opportunity to provide their hometown, work and school location. MySpace messaging is practical and should be considered by organizations.

4.2.1.3.3 Video Games

Video games have been a controversial topic among focus group discussions, due to the relation of how interesting they are and the extent of their educational value. Focus group members suggested that educational games are boring so they could reach only a very narrow audience. On the other hand non-educational games include a lot of violence and a concern is that they do not send the right message. However these games may still reach the target audience indirectly. They present scenarios that teach the player how to destroy things, they may therefore help to establish what is right and wrong in a particular situation. They also create the notion that there is an issue, which is very important. As suggested in the findings in Section 4.1 people in the target audience want to be a part of the solution, instead of just being told what to do. This includes finding the information about how to prevent a dangerous situation. Therefore, if a non-educational game can raise awareness about the existence of a danger, it indirectly achieves the goal of the project. On the other hand, the educational value can be achieved if the player can win the game only if he or she saves the most people or prevents the most damage. In particular, games with avatars can be successful due to their representation of real life. They also have potential for growth.

According to the survey results the average usage of online or console games by the university students is much lower than the averages for the majority of the activities described in the survey. However, 67% of the surveyed students indicated that they play either console or online games if considered as an aggregate. A more precise usage frequency distribution separately for online and console game is presented in Figure 39 and Figure 40 respectively.

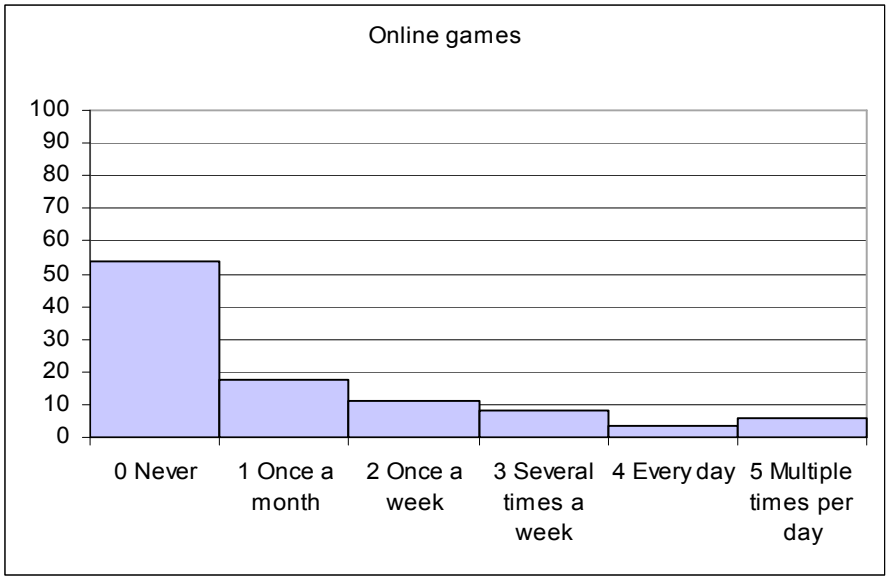

Figure 39 Usage of online games

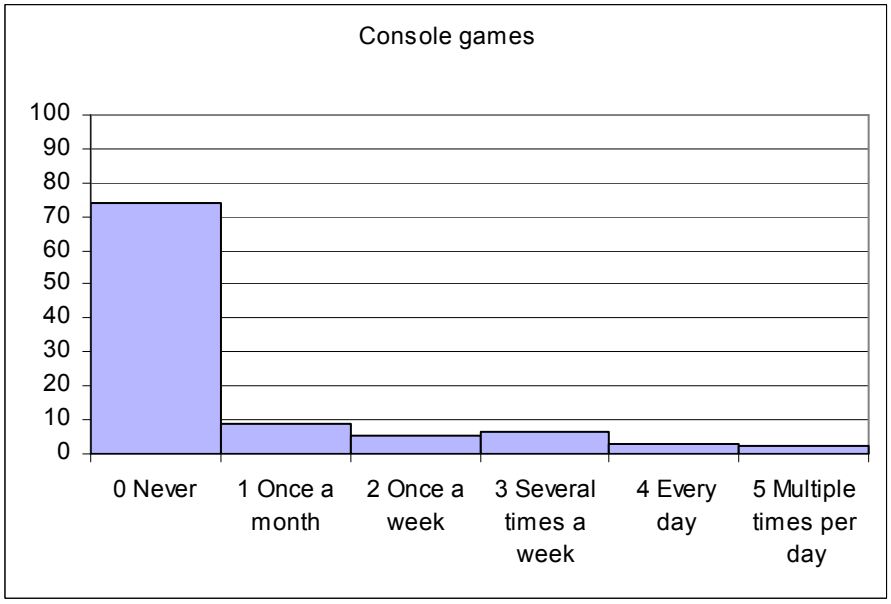

Figure 40 Usage of console games

Overall, there is great potential in video games, because many people play some form of a game (67%). Also there is a high potential for growth due to the growing interest in avatar and virtual world games such as SimCity and Second Life.

4.2.1.3.4 Enhanced Networks (GPS)

Global positioning systems have two particular applications for the project: mobile phone location and personal directions. Some new mobile phones have a built-in GPS capability that allows the mobile network to locate the mobile phone in the case of an emergency. This feature is especially useful if the mobile is used to dial "000" because the mobile location can be located so that help can be sent. This could be useful in the delivery of safety messages to mobiles within a particular area that would need to be alerted of a nearby fire or emergency.

In the future, global positioning systems could also be used to alert travelers about nearby fires and other dangerous events. For example, the GPS system could deliver relevant information about nearby activity if it detects that a person is within a certain area of danger. This would then alert the traveler to the danger and allow him or her to take the appropriate action.

4.2.1.3.5 P2P Programs

There has been increasing interest in the past years in p2p programs, such as Kazaa, Napster, and Skype. However, their current effectiveness in respect to safety message delivery in Australia is questionable. One reason for this is the current Internet situation in Australia which does not allow for an extensive usage of streaming programs. Another reason is that some of these programs, like YouTube have been banned in secondary schools. Nevertheless, with the improvement of internet functionalities in the future, the interest would most likely increase. There will also be more programs available. The capability of watching television shows online was identified as very interesting by focus group members. Some of the university students

presently use YouTube. They indicated that if there is an entertaining video about fire safety they would watch it.

Overall, presently p2p programs are not used very often, but they have a high potential for growth with the introduction of programs like Joost and with the improvement of the internet functionalities in Australia.

4.2.1.4 Alert Systems

Alert systems have been under development for the past several years in Australia. There are already several private alert messaging providers, and government programs which are considering or currently utilizing local or national alert systems. The trial systems and the results from the focus group discussions indicate that an alert system would be a successful reactive message delivery method. Young people stated they would sign up for such a service, provided that it is localized, not intrusive, and relevant.

Some of the issues that have been encountered throughout the trials of the alert systems in Western Australia and in the CIWS study have been related to mobile phone technology, e.g. coverage. According to Telstra representatives, however, these problems will be overcome in the future. According to several interviewees cell broadcasting is a solution to having localized and reliable message delivery.

Since there is a national emergency alert system already under development, there is not a need for a new method idea. However based on the specific needs of the target audience in respect to alert systems, there are several suggestions for its use. First, multiple messages need to be sent, to report the different stages of the fire, but not too many. Messages should also be localized, especially if the alert system is an opt-out

system. Additionally, the focus group members identified that they would like to receive maps of fire locations as well as text messages. Another aspect identified by people in the focus groups is the credibility of the sender of the messages. Lastly, there were several suggestions regarding devices that people use on a daily basis, which are not necessarily used for communication. Focus group members suggested that developing a device that is programmed to turn on automatically during an emergency would be useful. Such a method would be effective because it can attract the attention of anyone who is present when the device is activated. This technology could be applied to television, radio, and in the future to iPods/MP3 devices. The emergency message being broadcast would also play over any program or music currently being viewed or heard. Overall, alert systems could be a very effective reactive message delivery method and they can be improved with the development of technology.

4.2.1.4.1 Private Providers of Alert Messaging Legislation

According to Trevor Jenner who works with regulation policies at EMA there are approximately six private providers of emergency messages in Australia. There is currently no policy to regulate their activities and therefore government emergency agencies cannot control how they disseminate their messages. ACMA is the regulator of emergency service messages, but they cannot act in favor of or against private providers until appropriate policies are submitted. Private providers usually take information from official websites and distribute it to their subscribers. The danger with this is that the information sent might be distorted in the process or might not be truthful. However, private providers post notices releasing them of all liability in regards to what people choose to do with the information.

Private providers have the technical capacity to disseminate safety messages

acting as a secondary manager of the information. It is currently being done and can have potential benefits to the users like localized data being sent directly to their mobile

4.2.2 Growth Share Matrix

The Growth Share Matrix, developed in the 1970s by the Boston Consulting Group, gives a visual representation of the discussion in Section 4.2. Each of the technologies discussed in the project was evaluated in the Growth Share Matrix. The results are represented in Figure 41. The matrix provides a relative comparison of the different technologies based on their current usage - share of market, their prospect for growth with respect to the implementation of safety message delivery, and their availability to the target group. Each technology's availability to the target group is represented by the size of the bubble that represents it. The x-axis represents usage and the y-axis denotes growth prospect. For each technology the three dimensions: usage, prospect for growth, and availability, were determined based on the information gathered from the team's interviews, focus groups and survey in respect to the target age. The matrix does not provide a specific measure of the parameters, due to their subjectivity. However, it can be used in order to identify the best short and long term strategies for delivery of safety messages to young people. *(Net MBA Business Knowledge Center)*.

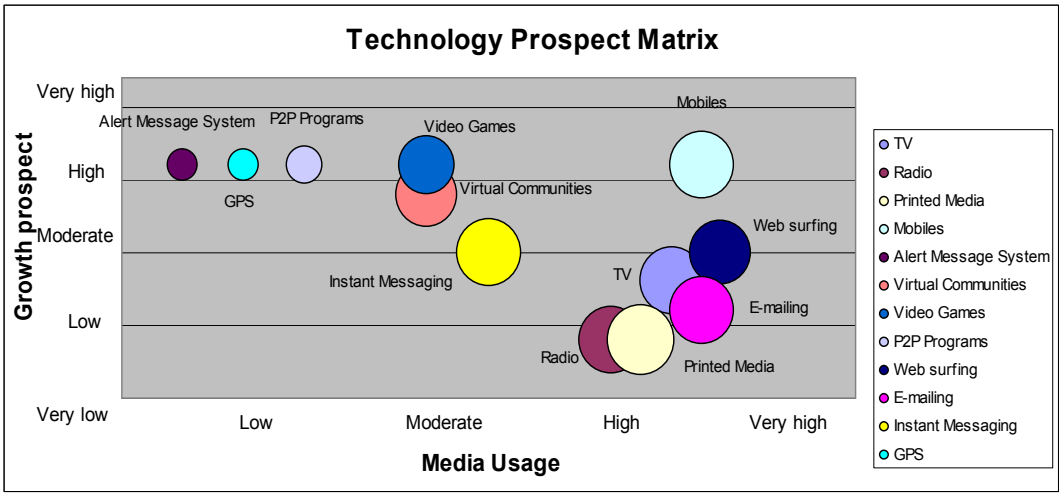

Figure 41 Growth Share Matrix

There is a large cluster of technologies that are currently used by most people in the target group. These include television, e-mailing, and web surfing. However, their prospect for growth in respect to message delivery is relatively low, thus making them a good delivery method in the present, but not as good of a prospect for the future. On the other hand, the bubbles that are above the moderate line of prospective growth are likely to be a successful method in the future.

4.2.3 SWOT Analysis of Method Ideas

Based on the literature review and the analysis of interviews, focus groups, and surveys, the team has identified a number of methods that could be used for the delivery of safety messages to the target group. Figure 42 is a comparative chart that presents all of the ideas of safety message method delivery the team has formulated. The ideas are organized according to the technology they encompass. The comparative chart is designed to help provide a straightforward visualization of all the ideas based on cost, type of messaging the method can be applied to – preventative and/or reactive, development requirements and expected implementation period. The comparative chart

enables the evaluation of the possible effectiveness of each idea based on the efforts and time period required for implementation. Following the comparative chart a SWOT analysis is performed to evaluate each idea individually. The SWOT analysis is an analysis technique that looks at each method from the inside – identifying its strengths and weaknesses, and from an outside perspective, observing what might be the opportunities and threats for that technology. Specific attention is paid to effectiveness, cost and characteristics of the methods.

Idea	Technology	Cost		Type of Message		Manufacturing Required	Content Development Required	Company Partnership Required	Permission or Approval Required	Implementation	
		Low	High	Preventive	Reactive					Near Future (1-5 years)	Distant Future (5+ years)
Automatic power on of television	Television		X		X	X	X	X			X
Safety education in television game shows	Television	X		X			X	X		X	
Short unexpected message in the middle of a television show	Television		X	X	X		X	X	X	X	
Community safety message television channel	Television		X	X	X		X	X	X	X	
Graphic and reality based commercials regarding fire safety	Television		X	X			X	X	X	X	
Commercials with successful advertising companies	* multiple		X	X			X	X	X	X	
Messages played prior to live radio stream or satellite radio	Radio/Internet	X		X			X	X	X	X	
Increased use of posters and ads in public places	Printed Media	X		X			X			X	
Free fire safety games or backgrounds	Mobiles		X	X			X			X	
Blinking light on mobile phones for emergencies	Mobiles		X		X	X		X			X

Text messages from a credible source	Mobiles		X	X	X		X				X
Messaging exit plan	Mobiles		X	X	X		X			X	
Fire related ads on instant messaging programs	Internet		X	X			X	X		X	
Instant Messaging FireSafetyBot	Internet	X		X	X		X			X	
Free music or video downloads after viewing safety video	Internet		X	X			X	X		X	
Distribution of safety videos on popular websites	Internet		X	X			X	X		X	
Fire safety messages on Google ads	Internet		X	X			X	X		X	
Fire safety links	Internet	X		X	X		X	X		X	
MySpace fire alert messaging system or fire map	Internet		X	X	X		X	X		X	
MySpace accounts for fire organizations	Internet	X		X	X		X			X	
Profile of fire agencies on a virtual world	Internet		X	X			X	X		X	
Short fire safety games before online games	Internet/Games		X	X		X	X	X		X	
In-game advertising	Video Games		X	X			X	X		X	
Part of a popular game based on fire safety	Video Games		X	X			X	X		X	
Fire safety game	Video Games		X	X		X	X			X	

Motor vehicle GPS alerts	GPS	X		X	X	X	X		X
Mobile phone GPS alerts	GPS	X		X	X	X	X		X
YouTube fire safety videos	P2P		X			X	X	X	
Short fire related video prior to online streaming programs	P2P	X	X			X	X		X

Figure 42 Comparative Analysis Chart

4.2.3.1 Traditional Media

4.2.3.1.1 Television

4.2.3.1.1.1 Televisions could be programmed to automatically turn on and deliver warning messages and alerts during an emergency.

Table 6 SWOT Television Idea 1

Strengths: • Automatically alerts people when there is an emergency • Provides a warning system that works even when the television is turned off	Weaknesses: • Cost • Not effective if people are not in a location with a television • Reception and coverage issues • Manufacturing required
Opportunities: • It can be applied for a variety of emergency messages • Converge with other systems to deliver automatic warnings via the Internet, mobile phones, iPods, MP3s, or other wireless devices.	Threats:

4.2.3.1.1.2 Incorporate fire safety education into popular television game shows.

Table 7 SWOT Television Idea 2

Strengths: • Interactive and fun educational tool • Covers many ages	Weaknesses: • Reaches only the audience of the particular shows
Opportunities: • Incorporation into a multitude of game shows	Threats: • Other popular television shows airing at the same time • Decreasing television usage

4.2.3.1.1.3 Instead of showing a fire safety message during commercials show a short unexpected safety message during the middle of a television show.

Table 8 SWOT Television Idea 3

Strengths:	Weaknesses:
• Unexpected • Hard to ignore • Not associated with commercials • Original	• Requires permission • Cost • Applicable only to people who are watching television at the moment
Opportunities:	Threats:
• It can be applied for a variety of emergency messages	• Decreased television usage • Objection and competition from other companies and organizations

4.2.3.1.1.4 Have a separate channel dedicated entirely to emergency messages. This would include information about fire bans, fire restrictions, conditions of current fires, and preventive messages when there isn't an emergency.

Table 9 SWOT Television Idea 4

Strengths:	Weaknesses:
• Always available • Multiple organizations can use it • Reliable because it is a fixed line network • Reaching a large portion of the population • Provides both preventive and reactive messages	• Cost • Manpower • Channel has to be promoted to the general public
Opportunities:	Threats:
• It can be applied for a variety of emergency messages	• Fewer people watch television • Network could go down during an emergency

4.2.3.1.1.5 Graphic and reality based commercials regarding fire safety. These could include real life stories and images of fire casualties.

Table 10 SWOT Television Idea 5

Strengths:	Weaknesses:
• Identified as effective by focus group members • "In-your-face" type messages grab attention • Target audience wants reality and not sugar-coated information • Could achieve change in behavior • Applicable to different aspects of fire safety	• Commercial that are too graphic can be inappropriate depending on audience • Government permission • Cost • People ignore the commercial even if they see them
Opportunities:	Threats: • Commercials are avoided by the population

4.2.3.1.1.6 Partnership with companies who have successful commercial campaigns, e.g. Victoria Bitter, Coca Cola, etc.

Table 11 SWOT Television Idea 6

Strengths:	Weaknesses:
• Association with successful campaigns and brand names • Popular among young people • Entertaining • Reaching a wide part of the target audience • Distributed in other medias such as YouTube	• Cost • Partnership required • Message might be distorted
Opportunities: • Concern of the partnering company regarding people's safety could increase positive perception of the company by the general public	Threats: • Brand might lose popularity over time • Association with a safety message could lead to lower interest in the partnering company

4.2.3.1.2 Radio

4.2.3.1.2.1 Safety messages played prior to enabling user to listen to a live radio stream or satellite radio.

Table 12 SWOT Radio Idea 1

Strengths:	Weaknesses:
• High usage • Increasing trend of people switching from traditional radio to this alternative	• Cost • Reaching only people who use this type of radio
Opportunities:	Threats:
	• Competition from stations that do not have a safety message stream included

4.2.3.1.3 Printed Media

4.2.3.1.3.1 Increased use of posters and ads regarding fire safety in public places: transportation vehicles and stations, toilette stalls, classrooms, waiting rooms, billboards, fast food restaurants, and others.

Table 13 SWOT Printed Media Idea 1

Strengths:	Weaknesses:
• Highly visible • Effective for captive audience that is unoccupied • Low cost • Visual effect	• People could easily ignore it • It is not original and thus not attractive to target group
Opportunities:	Threats:
	• Competition with other ads

4.2.3.2 Mobile Phones

4.2.3.2.1.1 Free fire safety games or backgrounds.

Table 14 SWOT Mobile Phones Idea 1

Strengths: • Free items are popular • Material distributed to many people • Backgrounds always present on phone, seen frequently	Weaknesses: • Small screens and keypads • Cost • People not particularly interested in the subject
Opportunities: • Series of games released over time • Enhanced graphics, as technology improves	Threats: • Other games and features on phones

4.2.3.2.1.2 Blinking light on mobile phones for emergencies that can be controlled by emergency organizations.

Table 15 SWOT Mobile Phones Idea 2

Strengths: • Alerts people about emergencies • Direct warning • Provokes people to go find information	Weaknesses: • Does not provide information directly • Blinking could be annoying • Will not work if phone battery is not charged • Manufacturing required
Opportunities: • Different lights or blinking patterns for different situations	Threats: • Mobile phone companies may not be willing to redesign phones

4.2.3.2.1.3 Text messages from a credible source, such as a number ("000"), sent by fire organizations.

Table 16 SWOT Mobile Phones Idea 3

Strengths:	Weaknesses:
• People recognize and trust the source • Provoke a response to the emergency • Provides reliable information	• Requires functional mobile phone network • Message size limited by phone capability
Opportunities:	Threats:
• Can be used for different emergency situations, general public news, etc	• Hackers may send false messages

4.2.3.2.1.4 Messaging mobile phones in a big commercial buildings with the exit plan

Table 17 SWOT Mobile Phones Idea 4

Strengths:	Weaknesses:
• Provides people with essential information necessary for escape from a building • Helps visitors know how to get out of an unfamiliar building	• People may not pay attention to the diagram/message • Poor reception in buildings prevents the service • Small display • Requires time to read the message
Opportunities:	Threats:
• Could be expanded to all buildings	• Mobile companies would need to install extra antenna/cells in buildings

4.2.3.3Internet

4.2.3.3.1.1 Fire related ads on instant messaging contact list and messages on instant messaging windows.

Table 18 SWOT Internet Idea 1

Strengths: • Can consist of text, images, videos, and sound	Weaknesses: • People might not pay attention to information
Opportunities: • Can be used among multiple instant messaging programs	Threats: • Use of other instant messaging programs

4.2.3.3.1.2 Instant Messaging FireBot (MSNBot, AIMBot)

Table 19 SWOT Internet Idea 2

Strengths: • Always available • Easy to access • Not intrusive • Instant messaging is popular among young people	Weaknesses: • Cost • Time consuming to design • Would require regular updates for fire alerts
Opportunities: • Can be used among multiple instant messaging programs	Threats: • Use of other instant messaging programs

4.2.3.3.1.3 Free music or video downloads for people who watch safety video or take safety survey

Table 20 SWOT Internet Idea 3

Strengths:	Weaknesses:
• Promotes fire safety • Free downloads are popular	• Requires people to take survey or watch video first • Cost • Requires partnership with companies which can provide the free services
Opportunities:	Threats:
• It can be applied for a variety of emergency messages	• Other free services for videos, music, etc

4.2.3.3.1.4 Distribution of safety videos on popular websites, via internet messaging programs, others.

Table 21 SWOT Internet Idea 4

Strengths:	Weaknesses:
• Distributes information • Visual and audio message delivery • Visible to a wide audience	• Requires fast download speed and large file download capability • Does not provide an incentive
Opportunities:	Threats:
• Expanded to other messages • Multiple videos to promote awareness	• Other interesting and free videos exist

4.2.3.3.1.5 Fire safety messages on Google ads.

Table 22 SWOT Internet Idea 5

Strengths:	Weaknesses:
• Many people use Google to search • Google can provide links to other websites	• Requires people to click on the ad • Limited by small size of link description
Opportunities:	Threats:
• Multiple topics linking to fire safety ads	• Many other links to compete with

4.2.3.3.1.6 Links placed on popular websites, leading to websites with fire safety information.

Table 23 SWOT Internet Idea 6

Strengths:	Weaknesses:
• People are already at the originating website • May cause more people to become aware of the problem	• People have to willingly click on the link • People must stay at the website long enough to learn something • Popularity of a website is subjective and changes over time • Popular website information might be misleading
Opportunities:	Threats:
• Multiple websites can lead to the same safety message website	• Other links may be distracting

4.2.3.3.2 Virtual Communities

4.2.3.3.2.1 MySpace fire alert messaging system or fire map display on login homepage.

Table 24 SWOT Virtual Communities Idea 1

Strengths: • Visible on the login homepage of MySpace • Would specifically be useful in reaching the target age group • Based on user location • Messages and maps could consist of text, images, videos, and sound	Weaknesses: • People might not pay attention to information • Success depends on popularity of MySpace
Opportunities: • Could result in the initiation of MySpace fire safety groups	Threats: • Other virtual communities • Hackers could post misleading information

4.2.3.3.2.2 MySpace accounts for fire organizations could be used to send fire safety messages and alerts.

Table 25 SWOT Virtual Communities Idea 2

Strengths: • Fire organizations can send out both preventative and reactive messages • Messages and maps could consist of text, images, videos, and sound • Can find users based on location	Weaknesses: • Users might be reluctant to add fire organizations as their MySpace friend • Success would depend on the future popularity of MySpace
Opportunities: • Could result in the initiation of MySpace fire safety groups	Threats: • Other virtual communities

4.2.3.3.3 Video Games

4.2.3.3.3.1 Have a part of a popular game to be based on fire safety in an interesting way (e.g., a World of WarCraft patch)

Table 26 SWOT Video Games Idea 1

Strengths:	Weaknesses:
• Fire safety gets a positive association • Reaches a target audience that is otherwise hard to reach • Interesting	• Requires a contract • Limited audience • Cost • Requires game developers • Players might not understand the message
Opportunities:	Threats:
• Game industry has been constantly growing	• Particular game losing popularity with time

4.2.3.3.3.2 Profile of fire agencies on a Virtual World type of game.

Table 27 SWOT Video Games Idea 2

Strengths:	Weaknesses:
• Growing popularity of the game • Original • Close to reality, which the target people want to see • Low cost	• Manpower to maintain • Reaching limited audience
Opportunities:	Threats:
• Growing interest in virtual world games	

4.2.3.3.3.3 In-game advertising

Table 28 SWOT Video Games Idea 3

Strengths:	Weaknesses:
• Moderate cost • Can be used in the most popular games • Reaches the audience indirectly, thus non-invasive	• Might not be too effective • Only applicable for short preventive messages
Opportunities:	Threats:
• Message will incorporate the standpoints of different type of agencies and organizations	• Competition with other ads

4.2.3.3.3.4 Play a short fire safety game before the real online game. This means that in order to play the online game that they want people will have to win a short fire related game.

Table 29 SWOT Video Games Idea 4

Strengths:	Weaknesses:
• Short • Direct benefit for the player • Requires the attention of the player	• Player might switch to a different online game
Opportunities:	Threats:
• Apply to other types of programs	

4.2.3.3.3.5 Develop an interesting non-educational fire safety game, that aims at bringing awareness about the existence of a problem

Table 30 SWOT Video Games Idea 5

Strengths: • Creates awareness about the existing problems with fire safety • Requires the player to solve the problem him or herself, and not just providing a solution • Interesting and fun	Weaknesses: • Cost • Requires development • Might reach a limited audience
Opportunities: • Partnership with game developers will enhance the video game	Threats: • Competition in the game industry is too strong

4.2.3.3.4

4.2.3.3.5 Enhanced Networks (GPS)

4.2.3.3.5.1 Automobile GPS alerts for the wildfires.

Table 31 SWOT Enhanced Networks Idea 1

Strengths: • Would alert users based on their location	Weaknesses: • Technology is not fully developed to perform this activity • People do not usually use GPS for everyday directions/traveling
Opportunities: • Increased usage of GPS	Threats: • Preferred usage of paper maps • Internet direction resources (MapQuest, Google Maps)

4.2.3.3.5.2 GPS on mobile phones or other mobile devices with warning for when you are close to a fire

Table 32 SWOT Enhanced Networks Idea 2

Strengths:	Weaknesses:
• Alerts people to presence of fire • Allows for time develop plan of action	• Requires appropriate network capabilities to send out mass messages
Opportunities:	Threats:
• Can be expanded to other messages	• Phone network may not provide adequate coverage

4.2.3.3.6 P2P Programs

4.2.3.3.6.1 Famous YouTube users posting entertaining fire safety related videos.

Table 33 SWOT P2P Programs Idea

Strengths:	Weaknesses:
• Popularity of YouTube • People likely to see because the user has a history of putting good videos on their profile	• Limited audience • Internet connection • Banned in secondary schools
Opportunities:	Threats:
• With improvement of Internet connections in Australia p2p programs will gain popularity	• Competition with other users • Competition with other programs

4.2.3.3.6.2 Short videos before streams on Joost, Yahoo videos, and other similar free service online programs.

Table 34 SWOT P2P Programs Idea 2

Strengths: • Popular programs among target audience • People would watch the short video because they want to receive the service after it	Weaknesses: • Limited audience • Cost of making the videos • Requires contract with companies distributing the program
Opportunities: • Can be adopted by other emergency agencies	Threats:

4.3 Recommendations and Conclusion

Based on the SWOT and Growth Share Matrix analyses that were conducted, the team has formulated recommendations regarding which methods have been identified as having the most potential to be successful. This section also gives recommendations regarding the direction that the project could possibly follow in the future. Although it is impossible to predict the future, it is important to analyze the current trends and data that are available in order to establish a set of recommendations that can be implemented by AFAC and its members., The recommendations provided are based on the different aspects involved in the implementation of the various delivery methods presented in Section 4.2.3. These aspects include cost, types of messaging the delivery methods can be applied to, development requirements, and projected implementation period.

4.3.1 Cost

Cost is a very important aspect to keep in mind when developing any new delivery method. Some of the delivery methods presented can be implemented at a low cost, while others are more cost intensive. The low cost delivery methods include:

- Incorporation of safety education in television game shows
- Messages played prior to live radio stream or satellite radio
- Increased use of posters and ads in public places
- Instant Messaging FireSafetyBot
- Fire safety links
- MySpace accounts for fire organizations

Based on the conducted research the team identified that of these low cost methods the ones that seem to be most effective would be the increased use of posters and ads in public places and the FireSafetyBot.

4.3.2 Types of Messaging

The next aspect considered is the type of message that can be delivered – preventive or reactive. Many of the delivery method ideas are designed to provide only one type of message. However, some methods can be used for the delivery of both types of messages. Organizations can select the best method or methods based on the type of message that they would like to deliver. Organizations can make use of one method

4.3.2.1Preventive

Of the delivery methods that can be used for preventive messaging the following were deemed as most effective:

- Graphic and reality based commercials regarding fire
- Commercials with successful advertising companies
- Increased use of posters and ads in public places
- Free music or video downloads after viewing safety video

4.3.2.2 Reactive

Reactive messaging has been discussed in depth throughout the paper specifically in respect to Alert Systems. Methods that do not currently exist and could be implemented for the purpose of reactive messaging are:

- Messaging fire exit plans to a mobile phone upon entrance to a building
- Text messages sent to mobile phones from a credible source
- Instant Messaging FireSafetyBot

The last two delivery methods can also be used to deliver a preventive message, which makes them particularly appealing. ,

4.3.3 Development Requirements

The different delivery methods discussed may have different requirements for implementation. These include manufacturing, content development, company

partnerships, and permission or approval. Methods can be ranked based on the ease of implementation. Some delivery methods require only one or two of the aspects mentioned above. Therefore, these delivery method ideas may be preferred by AFAC and its members. The methods that the team considers to have the greatest potential are:

- Increased use of posters and ads in public places
- Free fire safety games or backgrounds

4.3.4 Projected Period of Implementation

The amount of time required to develop and implement the various delivery method ideas also plays a role in the determination of its potential effectiveness. Some of the delivery method ideas can be implemented in the near future (within the next five years) while others will require a longer time period for development (greater than 5 years).

4.3.4.1 Near Future

Several of the delivery method ideas presented can be implemented in a relatively short amount of time. Such methods should be put into use in the near future because their potentials might not be as high in the future. The three most highly recommended method delivery ideas are listed below, followed by some additional ideas that are highly suggested by the team.

- Increased use of posters and ads in public places
- Text messages from a credible source
- Messaging exit plan
- Instant Messaging FireSafetyBot
- Free music or video downloads after viewing safety video
- MySpace accounts for fire organizations
- Part of a popular game based on fire safety
- YouTube fire safety videos

4.3.4.2 Distant Future

As part of the project the team has been asked to look not only into the near

future but the distant future as well. The team has developed six method delivery ideas specifically intended for use in the distant future. Delivery methods that are designed for the distant future require that the technology utilized has time to further develop and become more widely used by the target audience. Also it is very important not to forget that younger people seek innovation and originality. Therefore, delivery methods should be constantly updated and improved upon. Of the six delivery method ideas, the team has ranked text messaging to mobiles from a credible source and mobile phone GPS alerts as having the greatest potential. Short fire related videos prior to online streaming in p2p networks and the development of a technology that automatically turns on devices such as the television are the second in ranking. Motor vehicles GPS fire alerts and the development of mobile phones with blinking alert lights are the remaining two ideas for use in the distant future.

4.3.5 Recommendations for Future Research

There are several different aspects of this project that could be further investigated to provide more in-depth information regarding community safety messages and their delivery. The content of the message should be analyzed to be appropriate for the target audience. The content of the message can also help determine what type of delivery method to use. Message content was not the main focus of this project as the goal was to recommend delivery methods that will be effective in the future. The two areas of message content that could be pursued are effective messages for the target age group and effective messages for the delivery method.

Creating a message that is effective is an important part of message delivery. It is essential to find out what types of messages are most effective in reaching the target audience. It is also important to determine the most effective construction of a

particular message including how often the message is delivered and how different messages can build off of one another. Many interviewees stressed that fact that messages need to be repeated in order to be effective, but to a certain extent as to not to become a nuisance. Also, messages need to target a specific group by age, interests, or background in order to be a message that will be remembered.

Another area of message content that should be investigated is messages that are specifically designed for certain devices. There are some devices that are capable of accepting files with large pictures or videos such as internet browsers and televisions. There are other devices, such as mobile phones, that have smaller screen and therefore cannot receive pictures or videos that are very large or detailed because of the display size. Therefore, it is important to develop messages that are specifically formatted and developed to be the most effective for a particular type of device.

Along with message content, it is important to consider other external factors for safety message delivery such as budget, manufacturing and marketing. Budget is an important part of any project. Funding is necessary to pay people to develop messages, design new devices, and market the devices and messages to the public. It is also important to analyze manufacturing capabilities to determine whether or not a new device can be made or an existing device can be improved in a timely and cost-effective manner. Finally, it is important to analyze possible marketing strategies for both messages and new devices that could be used as delivery methods. Without marketing, the number of people that know about these messages and devices may not meet expectations for sales and public response.

Overall, it is important to keep in mind that technology will always be

changing, as will the preferences of young people. Trends among the target age group will influence what technologies are popular and which sources are most effective. Message delivery systems that utilize technology need to be monitored and improved upon on a regular basis in order to be in sync with the latest trends and most popular devices.

5 Conclusion

The completion of this project has involved several steps. The team was given a problem statement for the project and accordingly determined the project goals. The major goal of the project was to develop recommendations for the future delivery of community safety messages to the younger generations. Primarily, background research was conducted on the various topics involved in the project including fire safety education, community safety messages, demographic trends, and communication technology. Based on the knowledge acquired concerning these background topics the team determined additional information was necessary. The team's methodology involved the use of interviews with fire and safety personnel and technological experts, focus groups with young people, and a survey conducted among university students. The information gathered from these resources was analyzed and discussed. The team formulated a list of delivery method ideas that could be implemented in regards to safety messages. After presenting all of the possible ideas, the team gave recommendations as to which delivery methods would be most effective regarding aspects such as cost, implementation requirements, type of messaging each method is applicable to, and the projected period of implementation. Lastly the team presented their concerns regarding any additional research and investigation that should be done. It is important to consider this project as the basis of a larger concept that should be continuously built upon, as technology and trends will always be changing. Based on the team's report, AFAC and its members have been provided with the foundation and knowledge necessary to decide what delivery methods are appropriate for their goals.

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7 Appendices

7.1 Appendix A

7.1.1 History of AFAC

The Australasian Fire Authorities Council (AFAC) was established in 1993 to provide a common forum for the communication of information among different fire agencies in Australia. The council has 27 members and 10 affiliates from Australia and New Zealand. The Council's budget and finance are operated by AFAC Limited Corporation. The Council receives some limited funding by the government. AFAC receives the rest of the finances it needs through sponsorship that is facilitated with the agreement of the members. The members of AFAC then implement the projects and recommendations that AFAC develops (About AFAC).

Throughout the agency's fourteen year history, AFAC has undergone several changes. It was initially founded by the Australian Association of Rural Fire Authorities and the Australian Assembly of Fire Authorities. AFAC Limited was established one year after the Council and its purpose was to manage AFAC's business and marketing activities. New Zealand Fire Service became part of the organization in 1996 and the name changed from Australian to Australasian Fire Authorities Council. In 2003, AFAC facilitated the founding of the Bushfire Cooperative Research Center (CRC) and National Aerial Firefighting Centre (NAFC) of Australia.

7.1.2 AFAC Mission, Structure, and Members

7.1.2.1 AFAC Mission

AFAC has maintained a vision of a "community protected from the adverse effects of fire and other emergencies". The mission of the organization as stated on their website (Message, Mission & Vision) is to:

- Promote community fire prevention and education;
- Enhance the operational performance and accountability of fire and emergency service agencies;
- Promote change within the fire industry in a planned and controlled manner;
- Co-ordinate education and training policies and strategies to provide a learning environment for members' employees;
- Influence national fire policy, product and performance standards and fire management practices;
- Obtain and share knowledge on issues affecting members and facilitate discussion and debate on those issues;
- Facilitate research and development in areas of common interest to members, and
- Effectively represent its members in Australasian and international forums.

Currently, a six member Committee of Management reports directly to the Council. The CEO then reports back to both these bodies. For a better idea of the structure, please refer to the diagram below:

7.1.2.2 AFAC Members and Structure

The organizations that are members of AFAC are:

- New South Wales (NSW) Rural Fire Service;
- South Australia Country Fire Service;
- New Zealand Fire Service;
- Queensland Fire and Rescue Service;
- Forestry Tasmania;
- Airservices Australia;
- Australian Capital Territory Emergency Services Agency;
- Emergency Management Australia;
- Fire & Emergency Services Authority of Western Australia (WA);
- South Australian (SA) Metropolitan Fire Service;
- Tasmania Fire Service;
- Australian Council of State Emergency Services;
- Queensland Parks & Wildlife Service;

- Country Fire Authority (CFA) of Victoria;
- Northern Territory Fire & Rescue Service;
- Department of Environment and Heritage SA;
- Department of Sustainability and Environment (DSE) - Victoria;
- Department of Emergency Services Queensland;
- New South Wales (NSW) Fire Brigades;
- Queensland Parks and Wildlife Service;
- Forests NSW;
- The Department of Environment and Conservation (DEC), WA
- (Council)

Figure 43 is a representation of the organizational structure of AFAC.

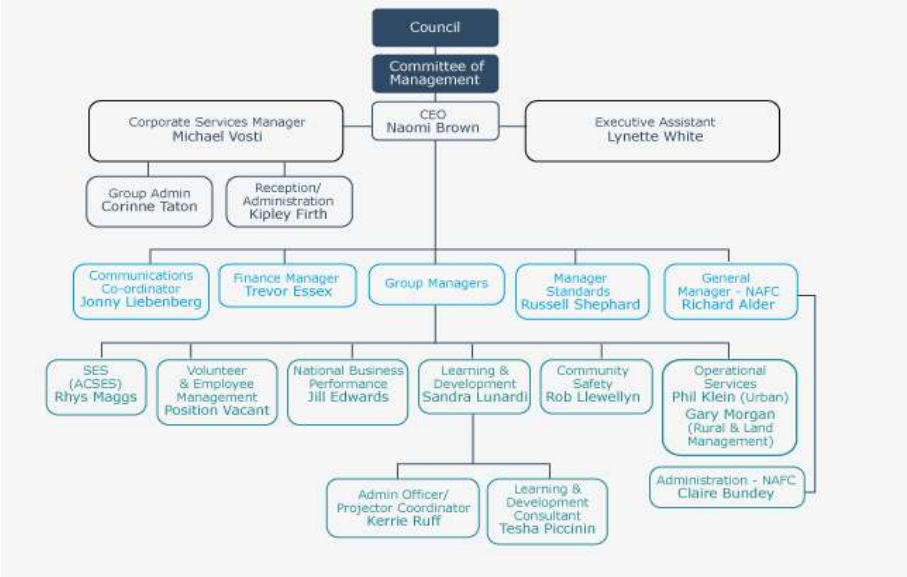

Figure 43 Organizational Structure of AFAC

7.2 Appendix B

Technological Terminology

Bandwidth (transmission capacity): Due to the enormous growth in Internet traffic, the bandwidth soon to be available on the Internet network, as well as too many offices and neighborhoods is immense. According to David Kots and Robert S. Gray (Dartmouth University), the bandwidth available to many users will remain limited by several technical factors, mostly low bandwidth on local connections. The bandwidth is expected to keep improving and augmenting the current 2-4 megabytes per second average in the United States (256 kilobytes per second -1 mega bytes per second in Australia) (*ABS*).

Customization: current Internet technologies allow the user to customize the way he/she accesses networks. These tools will increase and become more widely used in the future.

Information overload: the great amount of information online is overwhelming for many users. Search engines, web portals that offer a broad array of resources and services and filtering networks are dealing with this issue, however solutions are still limited.

Intranets: for safety purposes, companies are increasingly building their own networks to distribute information; also, little coordination is needed with outside organizations.

Mobile devices: users are buying everything from laptops to palmtops to mobile phones. All these gadgets have or will have Internet connection in the near future. Typically, these devices have wireless connections.

Mobile users: users can access personal accounts from any computer. Web terminals will become commonplace in public spaces, such as cafes, airports, and hotels. The growth in bandwidth will allow users to have full access to their files and applications from any terminal (Kots).

7.3 Appendix C

Age: _____ Gender: _____ International Student: YES / NO

How would you describe where you grew up?:
Large city Small City Suburbs Rural

Technology Usage

Which of the following items do you own: (please circle all that apply):
Ipod/MP3 player Cellular Phone PDA Computer w/Internet

Television Radio Other (please specify): _____

Which of the following items do you use on a daily basis (please circle all that apply):
Ipod/MP3 player Cellular Phone PDA Internet

Television Radio Other (please specify): _____

Which of the following items do you use most often (please circle only one):
Ipod/MP3 player Cellular Phone PDA Internet

Television Radio Other (please specify): _____

What forms of communication do you use (circle all that apply)?
Email Phone calls Text messaging Instant Messaging

Paper/memos/snail mail Blogging/Facebook/MySpace/etc Other: _____

Which form of communication do you use most often (circle only one)?
Email Phone calls Text messaging Instant Messaging

Paper/memos/snail mail Blogging/Facebook/MySpace/etc Other: _____

What is your primary purpose for using communication technology?
Homework / Research Communicating w/ family Communicating w/ friends

Obtaining News Entertainment Other (please specify):_____

Public Safety Messages

Have you seen/heard any public safety messages in the past 6 months? YES / NO

Do you remember the content of the message(s)? YES / NO

If so, please specify (fire safety, drunk driving, drug use, etc).
_____

Have you recently received any public safety messages on any of the following (circle all that apply)? (please circle):
Ipod/MP3 player Cellular Phone PDA Internet
Television Radio Other (please specify): _____

How aware were you of the topic before you heard / saw the message?
Not aware Little awareness Somewhat aware Very aware Fully aware

Do you feel the message was successful in educating you about the issue?
Not at all Slightly Successful Mildly Successful Very Successful Extremely Successful

7.4 *Appendix D*

This is a survey that is being used to gather information about communication technology and community safety messages. There are two main parts to the survey, with the first section consisting of questions relating to use and preferences of communication technology, and the second section relating to community safety messages.

The group conducting the survey is a group of four students from Worcester Polytechnic Institute in the United States. This survey is being conducted as part of a project analyzing new delivery methods for communication technology.

The survey can be returned via email to oz07afac@wpi.edu , via fax to (03) 9419 2389, or via post to WPI Team, Level 5, 340 Albert St. East Melbourne Victoria 3002 Australia

Age: _____ **Gender:** _____

Education: Less than high school diploma | High school diploma | Bachelor's Degree | Master's Degree | Doctorate / PhD | Post-graduate study

How would you describe where you grew up?:

Metropolitan Area: Inner City | Suburb | Outer suburb

Country Area: City | Town | Village | Remote

Technology Usage

1. How often do you use the following items or perform the following tasks?

0=never 1=once a month 2=once a week
3= several times per week 4= every day 5=multiple times per day

Ipod/MP3 player	**0**	**1**	**2**	**3**	**4**	**5**
Mobile calling	**0**	**1**	**2**	**3**	**4**	**5**
Mobile text messaging	**0**	**1**	**2**	**3**	**4**	**5**
Mobile Television	**0**	**1**	**2**	**3**	**4**	**5**
Personal data assistant (PDA)	**0**	**1**	**2**	**3**	**4**	**5**
Internet web surfing	**0**	**1**	**2**	**3**	**4**	**5**
Email	**0**	**1**	**2**	**3**	**4**	**5**
Internet text messaging	**0**	**1**	**2**	**3**	**4**	**5**
Online Shopping	**0**	**1**	**2**	**3**	**4**	**5**
Online Games	**0**	**1**	**2**	**3**	**4**	**5**
Facebook	**0**	**1**	**2**	**3**	**4**	**5**
MySpace	**0**	**1**	**2**	**3**	**4**	**5**
Blogging	**0**	**1**	**2**	**3**	**4**	**5**
Television	**0**	**1**	**2**	**3**	**4**	**5**
Internet Radio	**0**	**1**	**2**	**3**	**4**	**5**
Radio (AM/FM)	**0**	**1**	**2**	**3**	**4**	**5**
Video Conferencing	**0**	**1**	**2**	**3**	**4**	**5**
Console Games (Wii, Xbox, PS)	**0**	**1**	**2**	**3**	**4**	**5**
Global Positioning System (GPS)	**0**	**1**	**2**	**3**	**4**	**5**
Voice over IP (VOIP)	**0**	**1**	**2**	**3**	**4**	**5**

2. How often do you use the following message program?

0=never 1=once a month 2=once a week
3= several times per week 4= every day 5=multiple times per day

MSN Messenger	**0**	**1**	**2**	**3**	**4**	**5**
ICQ	**0**	**1**	**2**	**3**	**4**	**5**
IRC	**0**	**1**	**2**	**3**	**4**	**5**
Yahoo Messenger	**0**	**1**	**2**	**3**	**4**	**5**
Google Talk	**0**	**1**	**2**	**3**	**4**	**5**
Skype	**0**	**1**	**2**	**3**	**4**	**5**
AOL Instant Messenger	**0**	**1**	**2**	**3**	**4**	**5**
Other (please specify):_____	**0**	**1**	**2**	**3**	**4**	**5**

3. Which of the following communication companies do you use?

a. 3
b. Optus
c. Telstra
d. VirginMobile
e. Vodafone
f. Other (please specify)_____

4. How do you connect to the Internet?

a. Broadband
b. Satellite
c. Dial-up
d. Wireless
e. Public Access (library, internet café, school)
f. Other: _____

5. When a new communication device is introduced into the market, how soon do you buy it?

a. As soon as it is available
b. Within one month
c. Within six months
d. Within one year
e. I don't buy new devices

6. Please rate the following in terms of what functions you would like to see included on a device to be released in the near future.

1 = Should not be included 2= Prefer not to be included 3= Indifferent
4 = Would like to be included 5 = Must be included

Calling capability	**1**	**2**	**3**	**4**	**5**
Text messaging	**1**	**2**	**3**	**4**	**5**
Video Telephoning	**1**	**2**	**3**	**4**	**5**
Internet connection	**1**	**2**	**3**	**4**	**5**
File storage	**1**	**2**	**3**	**4**	**5**
Video recording/playing capability	**1**	**2**	**3**	**4**	**5**
Ability to capture and send photos	**1**	**2**	**3**	**4**	**5**
Music playing	**1**	**2**	**3**	**4**	**5**
Global positioning system	**1**	**2**	**3**	**4**	**5**

Community Safety Messages

7. Have you seen/heard any community safety messages in the past 6 months? YES / NO
If you answered YES to question 7, then please continue. If you answered NO, then stop.

8. Do you remember the content of the message(s)? YES / NO

9. If so, please specify the content of the message (fire safety, drunk driving, drug use, swim safety etc).
_____

10. Through what media or device did you receive the message?
_____

11. How aware were you of the topic before you heard / saw the message?
Not aware Little awareness Somewhat aware Very aware Fully aware

12. Do you feel the message was successful in educating you about the issue?
Not at all Slightly Successful Mildly Successful Very Successful Extremely Successful

7.5 Appendix E

7.5.1 Interview Minutes

7.5.1.1 James Shannon – February 7, 2007

Interviewee/Position:
James Shannon – President and CEO, NFPA
Judy Comoletti – Assistant Vice President for Public Education
Mike Hazell – Web Publisher
Amy LeBeau – Communications Manager, Public Education Division
Larraine Carly –Vice President, Communications
Bob – New Technologies
Company: National Fire Protection Agency
Interviewers: Victor, Stacie, Diana
Interview date: February 7, 2007

1. **Introduction:**
   a. Description and purpose of the project
   b. Goals of the project

2. **Questions:**
   a. What are the stages of community safety messages?
   b. Has NFPA used communication technology (i.e. mobile phones, iPods) to deliver messages?
   c. Does NFPA target young people 15 to 29 years?
   d. What creates awareness?
   e. What changes the behavior?
   f. Characteristics of wildfires and residential fires?

3. **Responses and Information Gathered:**
   - NFPA has not done anything with iPods but are working on incorporating audio files and podcasting
   - They have programs for children, but they are only intended to be used through the grade 8..
   - They suggested looking at Electrical Safety Education Programs.
   - They have programs to educate college students.
   - They have used public safety announcements (PSA) on the radio.
   - Look into low tech games that people play on their ipods or mobiles while traveling.
   - Contact existing music and other companies to post messages before service
   - Look into Superbowl commercials.
   - Focus on IM services. NFPA has not done anything with Facebook and MySpace.
   - Suggested contacting Firewise
   - The problem is there is nothing for age group 12-20 because they are a very difficult group to target and are more open to risk so there is a specific need

to target them

- Groups most at fire risk: the very young, the very old, the alcohol impaired, and the poor.
- Look at campersfiresafety.org – outreaching to college students.

7.5.1.2John Hall – February 21, 2007

Interviewee: John Hall
Company: Firewise
Position: Fire Research Director
Interviewers: Stacie, Victor
Interview date: February 21, 2007

1. **Introductions**:
   a. Project description/purpose
   b. Goals of the project

2. **Questions:**
   a. Has Firewise used communication technology (i.e. mobile phones, iPods) to deliver messages?
   b. Does Firewise target the 15 to 29 year old age group?
   c. Comment on approaches that change the behavior of the intended targets.
   d. Firewise role with wildfire.

3. **Responses and Information Gathered:**
   - Fire safety education with children age 5 to 12: active approach and interaction with teachers.
   - Safety messages are only effective when they reach their targets continuously and not only one time.
   - campusfiresafety.org aims materials at college kids and college parents
   - Causes of fire: arson, smoking, eating, electrical, candles, among others.
   - Japan fire agencies educate communities after fires have just occurred because of a greater awareness at the moment.
   - Investigate how to create interest in safety messages embedded in mobile phones and iPods.
   - Firewise does not target 12-25 age group
   - In the 5-12 age group the approach is to tell them what to do, while older children do not want to be told what to do.
   - Safety messages for adults should have an elementary school difficulty level for easy comprehension.
   - People follow safety messages more effectively by visual means (i.e. Sparky the Fire Dog).
   - Embedding educational value in messages without sending the wrong message is a difficult issue.
   - Many styles of art have to be considered due to different age groups
   - Visuals messages have to be appealing, however they should not make the image of fire a positive one.
   - Safety messages could be embedded in video games that have fire in their content.
   - Males have a 50% higher chance of dying in fire.
   - Rural areas have the highest death rate because of less education, longer response times and poverty.
   - Embed fire protection models into Computer Aided Design for better

visualization.

- A fire escape plan on a mobile phone wallpaper can be a possibility.
- Research what people have heard or what people want on new technology.

7.5.1.3 Erwin Danneels – February 21, 2007

Interviewee: Professor Erwin Danneels
Company: Worcester Polytechnic Institute
Position: Associate Professor in Management
Interviewers: Larissa, Diana
Interview date: February 21, 2007

1. **Introduction:**
   a. Description and purpose of the project
   b. Goals of the project

2. **Questions:**
   a. Based on your own experience, can you give us any advice or suggestions for conducting surveys?
   b. Comments/suggestions on the format of our test survey.

3. **Responses and Information Gathered:**
   - Professor Erwin Danneels has conducted several surveys. The surveys he does are usually sent out by mail. It is difficult for him to get a good response rate. In general surveys are difficult to conduct and get responses.
   - Advised us that focus groups would be the best approach for our project.
     - Need knowledge of how to conduct focus groups so they go efficiently.
     - It is not a question and answer session, but a discussion.
   - Discussed the survey/focus group questions
   - Suggestions made about the formatting and wording on some of the survey questions.

7.5.1.4 David Lucht – February 23. 2007

Interviewee: David Lucht
Company: Worcester Polytechnic Institute
Position: Professor and Director Emeritus, Center for Firesafety Studies
Interviewers: Larissa & Diana
Interview date: February 23, 2007

1. **Introduction**:
   a. Description and purpose of the project
   b. Goals of the project

2. **Questions:**
   a. Can you tell us more about what you know about your experience with Generations X and Y – behaviors, preferences, etc.?
   b. Discuss a project that Professor Lucht advised on risk communication about rip currents

3. **Responses and Information Gathered:**
   - Generations X and Y – also called Millennials
   - Millennials are very safety conscious
   - There is a stronger relationship between the Millennials and their parents
   - An approach to the different methods is a cost-effectiveness analysis
   - Suggestions for further research and comments:
     - Focus on the goal!
     - Look at marketing literature
     - Research literature on public awareness programs structures
     - Look at literature on Australian people in the target audience
     - Research communication technology companies in Australia
   - Surveys can be a useful tool, but take too much time to be in a statistically representative form; better to do a pilot study and recommend AFAC to continue with it later

7.5.1.5 Asvin Phorugngam – March 16, 2007

Interviewee: Asvin Phorugngam
Company: Victoria AIDS Council / Gay Men's Health Center
Position: Health Educator
Interviewers: Larissa, Diana
Interview date: March 16, 2007

1. **Introduction:**
   a. Description and purpose of the project
   b. Goals of the project

2. **Question**s:
   a. What information can you give us about the topic of community education from your experience as a health educator?
   b. What methods does the Victoria AIDS Council use to deliver messages to the public?
   c. Are they any specific problems you have encountered with getting messages across to the younger age groups?

3. **Responses and Information Gathered:**
   - Community education is about community awareness. You need to make people aware of the problem or risk.
   - Focus on message:
     - Type of message: informative, warning, etc.
     - Content of message: one clear concise message, do not mix messages. The content of the message will help determine how to best present the material and deliver it.
     - Target Audience: who is the message intended for?
   - Visual messages capture people's attention more than just words/text.
   - Multi-tools to reach target population - can't use only one tool, need different approaches in order to reach the maximum amount of people. Examples: posters (basic level info), peer education (intensive, time consuming), community functions, internet chat rooms (chats are popular for younger people), articles, radio program (can reach a large number of people at once).
   - Divide target population into smaller groups: 15-29 is a broad range of ages from young teenager to adult.
   - Evaluating the effectiveness of a message can be difficult. Evaluation process should be built in throughout process, not at the end. In order to evaluate something the aimed impact on target audience must be determined early on in order to figure out how it can be measured?
   - It is a challenge to reach people who do not want to listen to the message you are trying to convey.
   - Social change makes it hard to follow and keep up to date on the current situation. By the time you figure out and research a social behavior it is a year or two later and things have changed again.
   - Bushfire and residential fires are two different topics. The rural area is the

target for bushfire messages. The team should look into rural education, contact schools outside the city and talk to fire departments.

4. **Recommendations:**
   - Focus groups are a good idea for this project.
   - Book “Do It Yourself Research”

7.5.1.6 Richard Thornton – March 16. 2007

Interviewee: Richard Thornton
Company: Bushfire CRC
Position: Research Director, Wildfire Research
Interviewers: Stacie, Victor
Interview date: March 16, 2007

1. **Introductions:**
   a. Description and purpose of the project
   b. Goals of the project

2. **Questions:**
   a. Has Bushfire CRC used communication technology (i.e. mobile phones, iPods) to deliver messages?
   b. Does Bushfire target the 15-29 year old age group?
   c. Comment on approaches that change the behavior of the intended targets
   d. What are some of the issues conveying safety messages in rural areas?
   e. Is there any difference responding to fire between people living in rural and metropolitan areas?
   f. Ideas for the future (mobile phone wallpaper, avatars)

2. **Responses and Information Gathered:**
   - Currently mobile phones are not effective for emergency messaging, since they cannot localize everyone due to shortcomings in coverage.
   - Cell broadcasting is an interesting technology; however it is still not very developed. It lets a person see where fire is by localizing it in a certain cell on the screen (television, computer) and localizing him/her in the same screen and it evaluates the development of this fire.
   - There have attempts in Europe to use SMS messages in case of emergencies by overwriting anything that is on a mobile screen with an emergency warning.
   - The RFS has websites where rural communities can check for fire safety information and fire alerts. These website are becoming more reliable.
   - Bushfire has not done work on different age groups, however they have researched different ethnic groups in Australia (i.e. aborigines) and their awareness and behavior to fire.
   - In order to convey a risk message, risk has to be established, then an explanation of how a risk applies to a particular group is required and finally there is the communication step.
   - CFA website had a major increase in use of website. The website stopped functioning last year because of the large amount of people trying to access.
   - A mobile phone system could work if there is a registration process beforehand to an emergency alert network.
   - 3G networks in Australia do not cover enough area. 2G networks might work better for this purpose. However, people are increasingly switching to next level technology.

7.5.1.7 Renato Iannella – March 17, 2007

Interviewee: Renato Iannella
Company: National Information and Communication Technologies Association Australia, Queensland
Position: Researcher in the areas of the future ICT needs of the emergency and disaster management sector
Interviewers: Diana, Victor
Interview date: March 17, 2007

1. **Introduction:**
   a. Description and purpose of the project
   b. Goals of the project

2. **Questions:**
   a. Can you tell us more about your experience with emergency communication?
   b. Can you tell us more about your experience with e-learning?
   c. Suggestions or recommendations?

3. **Responses and Information Gathered:**
   - Emergency Communication
     - work on public warnings in case of an emergency
     - research focuses on the technical aspects of the delivery of information
     - Develop information standards for emergency messaging
   - Issues and concerns with emergency communication are:
     - Stability of the network – can it handle overload
     - Resource management
     - Communication among disaster management groups in a disaster center
   - Protocol Systems (as follows) – those are protocols for instant messaging for machine processing
   - SAFE (Smart Applications For Emergencies)
     - About 50 people work on the project in 4 main areas – sensors, information, agents, and networks
     - Focuses on the information side.
   - CAP – Common Alerting Protocol - http://www.oasis-open.org/committees/download.php/15135/emergency-CAPv1.1-Corrected_DOM.pdf
     - Standard for the message format for PC (Personal Computer) to PC transfer.
   - EDXL – Emergency Data Exchange Language
     - This is used for resource management
     - In particular it is dealing with the tracking, allocation, transportation and return of resources
   - RSS - common technology used by web browser to get a syndicated string of information to people's web browser. It just appears in the web browser. It is called a push technology. People subscribe to that service.

    - feed://wcatwc.arh.noaa.gov/rss/tsunamirss.xml
    - This technology has been used in the US for weather warnings; in California it was used for all kinds of hazards – weather, biological, traffic, etc.
- OASIS – standards body on information
- Sending messages via SMS messages
    - Problem: performance of the server sending messages and not the coverage of the network
    - Alternative technologies: cell broadcast – this service contacts mobiles directly. Presently it is not used for a particular purpose, but it is particularly good for emergency broadcast.
- Other:
    - It is best to take a multipoint approach
    - PDAs are a good method to get to busy people
    - Photos and small videos are effective, because they allow people to experience the message versus just reading it
    - If the group targeted is young kids, they go back home and get the message to their parents, which is an effective method to reach those 2 groups.

7.5.1.8 Rob Taylor – March 19, 2007

Interviewee: Rob Taylor
Company: Metropolitan Fire Brigade (MFB)
Position: Executive Manager of Community Education
Interviewers: Stacie, Victor
Interview date: March 19, 2007

1. **Introductions:**
   a. Description and purpose of the project
   b. Goals of the project

2. **Questions:**
   a. What has MFB done / found that changes the behavior of young people?
   b. How do they reach young people?
   c. What problems exist when communicating with young people?
   d. Has MFB thought about using mobile phones to send any kind of safety message?
   e. Does MFB have any method of measuring effectiveness of their fire messages?
   f. Have they used different methods to reach different groups?
   g. Is there any specific type of message – visual or audio – that young people respond to more than another?

3. **Responses and Information Gathered:**
   - MFB has used exit strategy posters in toilet stalls and clubs in order to make people more aware about exits from a building.
   - MFB provides some road safety training for year 11 students, in conjunction with Victoria Police, government, ambulance services, and schools
   - Possibilities not pursued by MFB:
     - There is a free text message service which involves newsletters with ads or consumer surveys. When people look at the ads, they get points. When people but something from the ads they get more points. Possible message could be "have you looked for exits?"
   - Nothing has been proven to change the behavior of our target age group
   - Necessary items in a safety message:
   - Tailored for age group (not to simple or complex)
     - Tell younger children what to do
     - Give older children tasks relating to the subject to engage them
   - Keep the information involved in the curriculum so that children can learn reading / writing while learning fire safety.
   - Need to be repeated over time.
     - Prep grades could repeat information after one week.
     - Information was fading after 3 months.
     - Information was not correct or not remembered by 6 months.
     - Use Big Book to peak young children's interest (up to age 12).
   - Big Book - Firefighters visit classroom and children given task to complete - Reward for completed task

- Don't incorporate fire safety with school for older kids
  - Hand out comic books at community events rather than it just being more info from school
- Incorporate with Victoria Education Learning Standards (VELS) curriculum so that children learn reading / writing and fire safety simultaneously
- Problem with older teenagers / young adults
  - Very mobile
  - Many different groups with different interests
  - No longer one classroom unit
  - Some no longer in school – at apprenticeships or other job
  - Some focused on studies / university / career
  - No research to date about this age group's learning style
  - Tertiary (high school) students don't want to change and are hardest to reach
- MFB wants to develop a "90-year plan"
  - Start in primary school with programs that continue through school years
  - Develop plan for young people out of grade school
  - Develop plan for career people and middle aged
  - Already have programs for elderly
  - Each group would receive a message every 7 years or so after school
- Urban environment is more difficult to reach than rural areas with respect to wildfires, but rural environment is harder to reach than urban areas for structure fires.
- Rural areas have Television , Radio, Newspapers
  - CFA has to contact multiple stations in order to cover the small pockets of groups.
- Currently have programs for caretakers; Age 15-55 is hardest to target, while less than 5 and over 60 are the most at risk.

4. **Recommendations:**
   - Have free MP3 with image or questionnaire – one question about fire safety is asked and a correct answer means a free MP3 download. MP3 kept up for one month
   - Competition in video games in order to keep people interested
   - Have message nested within the game context so that it is not blatantly obvious

7.5.1.9 Thas Nirmalathas – March 19, 2007

Interviewee: Professor Thas Nirmalathas
Company: National Information Communication Technology Association (NICTA)
Position: Lab Director
Interviewers: Larissa, Diana
Interview date: March 19, 2007

1. **Introduction:**
   a. Description and purpose of project
   b. Goals of the project

2. **Questions:**
   a. Can you tell us a little more about NICTA?
   b. What methods of communication technology are currently under investigation/development for future use?
   c. Do you have any contacts or names of companies that might be useful for the research of this project?

3. **Responses and Information Gathered:**
   - About NICTA:
     - NICTA is funded by the Federal Government's Department of Communications
     - Research focuses on technology and its usage in the community and industry.
   - Wireless networking
     - 60 GHz: high frequency, high bandwidth & greater amount of coverage.
     - Only a limited amount of bandwidth that can be used; approximately 1G/ user.
     - Wireless broadband service is not widely used due to limited areas of coverage, technical problems and cost.
   - 3G:
     - Data bandwidth is in mbps which can allow for communication through media messages.
   - Fiber optics
     - Fiber optic networking can be used to carry a large volume of user info.
     - There are many fibers that are currently unused/unlinked.
     - This type of networking can be used to connect rural areas.
     - Research is being done on how to back up the network to recover from disasters (disaster proof technologies).
   - New technology
     - After being developed new technologies have to be adapted to society.
     - There is a lack of political interest in promoting new technologies and the political market must be conducive for investment.
   - Japan
     - Japan has a consumer driven market.
     - Use of EMS broadcast systems, live coverage- used mainly for earthquakes.

    - Free subscribal to such broadcasting attracts users.
    - Japan is ahead of the rest of the world in terms of technology.
- Gaming
    - Gaming is popular among young people.
    - Online gaming would be a good place to introduce message.
    - There is a wide distribution of gaming servers.
- Delivery of messages:
    - Broadcast through Internet.
    - Peer to peer technology – use of existing computer networks.
    - Optimize delivery of messages to reach the most people.
- Suggested Contacts:
    - NICTA in Queensland: Renaeto Iannella.
    - Telstra
    - ITS Australia
    - Santosh Kulkarni: NICTA (peer to peer technology)
    - Yokusk Radio Communications lab - www.nict.japan

7.5.1.10 Penny Wolf and Alan Rhodes – March 20, 2007

Interviewee: Alan Rhodes and Penny Wolf
Company: Country Fire Authority (CFA)
Position: Manager of Community Safety Research and Evaluation Health Educator - Juvenile Fire Awareness Intervention Program
Interviewers: Larissa, Diana, Stacie, Victor
Interview date: March 20, 2007

1. **Introductions**
   a. Description and purpose of the project
   b. Goals of the project

2. **Questions**
   a. What has CFA found that changes the behavior of young people?
   b. What types of community messages are sent?
   c. Has CFA thought about using mobile phones to send any kind of safety message?
   d. Does CFA have any method of measuring effectiveness of their fire messages?
   e. Has CFA noticed any particular visual/audio that appeals to younger people as far as messaging?
   f. Discussion of survey questions.

3. **Responses and Information Gathered:**
   - Programs for younger children and older people are common, but there is nothing made for the target age group.
   - Adults are more likely to be affected by bushfires because they are more likely to own a house.
   - The only messages that can reach people in the target group are general public education which is not tailored to a specific age group.
   - Information is necessary to understand the problem, how to respond to the problem, and how to provide assistance.
   - The 15-29 year old age group is not particularly at risk because they are not the age group dying in residential fires –they are more at risk from drugs, alcohol, traffic accidents, etc.
   - Young people are risk takers, and they do not perceive any fire risk and there for are hard to reach with safety messages due to lack of attention
   - For young people, preparing a home and making decisions about how to keep a home safe are usually not an issue as the majority are not home owners.
   - Need to look at other risks, the messages sent in relation to those risks, what types of issues are discussed.
   - Participated in the Community Information Warning System Trial, experiment with Telstra using SMS messages to warn people about emergencies, contact: Robin, #9651002.
   - Use Internet to post current incidents.

- CFA communicates with public using current incidents link on website, television, radio, other press, and Victoria Bushfire Information Line (VBIL) telephone service.
  - Bushfire info line provides info about home preparation, safety, current emergencies, can be accessed through phonebook.
- Effectiveness is measured through surveys.
  - Surveys of people affected by recent fires.
  - People have high exposure rate to messages through traditional means, as well as high recollection rates.
- Everyone has varying learning styles, so messages delivered in several different ways would reach the greatest number of people.
- Message changes based on educational and social background, as well as age – "one size does not fit all".
- Young people like to be part of the solution – ask them what they think, they like to work things out themselves.
- Must connect message about fire issues with the person – if the person does not perceive relevance, then they will not pay attention to the message.
- Link messages with other messages, such as a more general safety message.

4. Recommendations:

- Traffic Accident Commission (TAC): deals with community road safety for young adults.
- Anti-Cancer Council- skips targeting teen age group, focuses on young children and older adults.
- Victoria University of Technology – Fire Safety Program
- Game- Second life

7.5.1.11 Ewen Hill – March 21, 2007

Interviewee: Ewen Hill
Company: Internet Development Australia (IDA)
Position: Website Developer
Interviewers: Victor, Diana
Interview date: March 21, 2007

1. **Introduction:**
   a. Description and purpose of the project
   b. Goals of the project

2. **Questions:**
   a. What is the Incident Alert System and how does it work?
   b. How do people sign up for the service, how is it different from other services?
   c. How many people use the service?
   d. What technology is used for it?
   e. What is IDA currently working on?
   f. What interactive things are in the Incident Alert System such as maps?
   g. Can this system be used in combination with other delivery methods?
   h. What fire agencies are involved?
   i. Do people in rural and metropolitan areas use this service differently?

3. Responses and Information Gathered:

- There is one main telecom provider: Telstra.
- There are some problems to be fixed (i.e. the network goes down during a fire, signal problems).
- Safety messages are only effective when they reach their targets continuously and not only one time.
- The emails are sent every ten minutes.
- There are a few thousand numbers, predominantly around Melbourne.
- The agencies that are involved with IDA are MFB and CFA.
- The email or SMS just goes to user, not agency.
- The format for SMS messages and emails is similar.
- 20% coverage of rural communities.
- Age groups: late 20s predominantly, up to 55, few retired people.
- After the message is received, the user decides what to do.
- People have experience with wildfires in rural areas.
- CFA provides the information to IDA about wildfire (location, time)
- 3G is also available, but there are a lot of costs involved. It will be possible eventually to use 3G and incorporate maps and distance to fires.
- No RSS technology, but it will upload approximately every 3 minutes.
- The latitude and longitude is the main data needed.
- There are home data exchange systems, however, they are not very reliable.
- IDA does not tell users what to do in case of a fire due to legal issues.
- Plans in 5-10 years: mapping, refining process, sentinel satellite to watch

fires in real time.

- Plans for next year: cover more towns in vicinity and flash messages on television, other things with SMS (activate sirens).
- Next summer will double users.

7.5.1.12 Trevor Ives – March 26, 2007

Interviewee: Trevor Ives
Company: Emergency Services Telecommunications Authority
Position: MIS Analyst
Interviewers: Stacie, Victor
Interview date: March 26, 2007

1. **Introduction:**
   a. Description and purpose of the project
   b. Goals of the project

2. **Questions:**
   a. Do you know about anything that has been done regarding using technology for community safety messages?
   b. What do you know about mobile phone networks (how they work, what types of communication are accessible)?

3. **Responses and Information Gathered:**
   - ESTA is a government statutory authority that is responsible for call receiving and dispatching. They work with all emergency services in greater Melbourne, and fire and state emergencies in the rest of Victoria (no police or ambulance dispatching in the rural areas yet).
   - Suggested looking for report about test early warning system. Test was conducted last year, involved Telstra and CFA and provided an early warning system about fires being present
   - Mobile network coverage is always a problem when trying to pursue mobiles as a form of every day technology
     - Current networks do not penetrate buildings very well
     - Microcell technology is used to boost network (antennas on top of light poles)
     - Crown Casino has two cellular base stations with wires and antennas throughout the building
     - Cellular hubs on buildings such as universities
   - Australians want and expect good coverage for mobile phones
   - Two types of messages
     - SMS – short message service. Used for text messaging, original purpose included advertisements
       - No guaranteed delivery timeframe
       - Messages received in order sent
       - Messages stored until phone is powered on
       - Messages must be sent as separate messages (community safety message sent to 10 phones is 10 messages)
     - Other short message (short global messages? – he could not remember correct term)
       - Messages can be sent to every mobile that is using a particular base station (see below)
       - Messages are not stored – only received if phone is powered on

Messages are not separated by phone because they are broadcast to all phone in range of the base station

- Base stations for mobile phones
  - The stations themselves are scattered
  - Can be used for SMS or other short (global?) messages
- Telelocation – finding a mobile phone based on ping triangulations from mobile towers around the phone
  - Can be used to locate phones, but only on an individual basis
  - Permission must be granted from telecommunications company therefore it does not work in emergencies

4. **Recommendations/Comments:**
   - Must have an idea that is supported and seamless across all networks and service providers, indoors and outdoors, etc
   - How will you notify people without landline or mobile (for example those using voice over internet protocol (VOIP)?
   - Up until 10 years (give or take) Telstra was the only landline and mobile phone service provider, Telstra still owns all landlines in the area

7.5.1.13 Santosh Kulkarni – March 26, 2007

Interviewee: Santosh Kulkarni
Company: National Information and Communication Technologies Association Australia
Position: Researcher in the areas of peer-to-peer (p2p) networking and video streaming
Interviewers: Larissa & Diana
Interview date: March 26, 2007

1. **Introduction**
   a. Description and purpose of the project
   b. Goals of the project

2. **Questions and comments by WPI students:**
   a. Can you tell us more about your experience with p2p networking?
   b. Can you tell us more about your experience with video streaming?
   c. Which companies and organizations use those technologies?
   d. Do you have any contacts with communication technology companies that we can use**?**

3. **Responses and Information Gathered:**
   - Effective messaging methods:
     - Messages received through email are seen as spam.
     - Internet is used on a daily basis by younger people.
     - Messages in games are considered effective
   - Online gaming:
     - Online gaming can have an in-game message. How receptive are people?
     - Online gaming uses a central server.
     - Gaming is a popular behavior of young people 15-29.
     - Asia is big in online gaming.
   - Advertising:
     - Two types of ads:
       - Ads that give direct information - a specific safety message
       - Ads that advertise websites, or sources on information
     - Advertising can be done through
       - Online games – Massive Technologies is a company that does advertising in videogames, i.e. they incorporate ads of companies in games
       - Fire organizations, and their websites, by having links to the fire organization websites through other popular websites (e.g. The Age news - http://www.theage.com.au/; Sydney Morning Herald - http://www.smh.com.au/)
       - Google ad clicks – reaches a wide audience
   - Peer to Peer Networking:
     - Not one server, no specific number of users; it is a decentralized manner of delivering information

- Started with Napster & Kazaa – exchange/transfer of music files.
- File sharing is the most popular application of peer to peer networking.
- Video steaming is a delay sensitive application, don't want video to skip and stop.
- Allows delivery of various applications in a cost effective manner.
- Can be used with fire safety messages especially in rural areas, where there is no network
- Skype is a peer to peer application- Voice Over IP- VOIP
- The mobile p2p networking is called ad hoc networking
- Hand held devices are widely used. Online gaming will be available on mobile devices, through this technology.
- Mesh computing- introduced a few years ago- data transfer, connect to Internet
- Peer to peer makes video streaming easier and more efficient.

- Video streaming:
  - Video streaming on Internet is low quality because Australian access networks are not able to perform high quality steaming, only up to 1 megabit
  - Two applications:
  - On demand – files on server, people can access anytime.
  - Live or webcasting- sending to everyone at the same time, requires a lot of streams and is difficult to do.
  - Unicast- 1 stream for every user
  - Is it legal to send out messages out to mobile phones?
  - Mobile phones have restrictions: quality, bandwidth and processing power.
- Contacts – will send us contacts over e-mail
  - Massive Technology- in game advertising; recently purchased by Microsoft
  - Telstra contacts - Chief Technology Office (CTO)
- Ideas
  - Advertising through a p2p network similar to Kazaa and Napster – Joost. It has not yet been released, but it will allow people to stream videos and television services on Internet using peer to peer. It is developed by the makers of Kazaa and Skype

7.5.1.14 Karen Roberts – March 27, 2007

Interviewee: Karen Roberts
Company: Fire Emergency Services Authority
Position: Executive Director of Community Development
Interviewers: Diana, Victor
Interview date: March 27, 2007

1. **Introductions**
   a. Description and purpose of the project
   b. Goals of the project

2. **Questions and comments by WPI students**
   a. To what extend do you use technology in your programs and do you think this is an area worth developing?
      i. Mobile phones
      ii. Internet
   b. Do you know something about the Incident Alert program and is there something similar to that in West Australia?
   c. If yes, what are the community messages you are sending?
   d. What groups are you targeting?
   e. What have you found that creates awareness and behavioral changes in the target audience?
   f. What disaster response programs are most effective?
   g. Can you send out some surveys if you have young people in the agency?
   h. Do you track how many people visit your website?

3. **Answers provided by Karen Roberts**
   - Target groups – historically they have not targeted youth. The target audience is geographically based and there are programs for indigenous people, seniors, backpackers and hostel visitors etc.
   - They do programs not only for fire but also for other emergencies such as storms etc.
   - Methods are effective are:
     - Localized
     - When the community identifies with the message
     - When there is a trigger such as a recent incident, so that people are more safety conscious
   - Public Alert System
     - It is an opt-out service
     - It sends community alerts via the Internet, SMS messages, and land line
     - There have been pilot tests in the country and in a small urban area
     - System is supposed to come out for the 2007-2008 period
     - Messages contain
       - Major fires
       - Where are they located
       - What do people need to consider
       - Stage of the fire
       - Affection expectations

        - When people can return to the area
    - Information about the fires is received by FESA or the local FB or whichever service is responsible for that district
    - There are no legal issues with that system
- Websites data
    - They found that 80% of the people who start downloading one of their brochures and drop it, because the files are too big
    - It is useful for companies to keep track of their website visits

5. Recommendations/Comments:

- Will send us the evaluation of the pilot run of the Public Alert System
- Will give us more information about the media and public campaign related to the Public Alert System when it starts running
- Will distribute surveys to young people

7.5.1.15 Amy Seppelt – March 29, 2007

Interviewee: Amy Seppelt
Company: Metropolitan Fire Services, Queensland
Position: Fire Engineer
Interviewers: Victor & Diana
Interview date: March 29, 2007

1. **Introduction**
   a. Description and purpose of the project
   b. Goals of the project

2. **Questions:**
   a. Does MFS use technology such as SMS in mobiles and emails in preventive and reactive cases?
   b. Do Fire Engineers at MFS create safety programs or systems that target young people?
   c. What technologies do you think could reach young people?
   d. Do you know anything about the Incident Alert System? Is there anything similar to that in Adelaide?

3. **Responses and Information Gathered:**
   - Amy Seppelt is involved with a number of committees in Australia. She also is responsible for training firefighters and working with buildings fire safety. Part of her work is also to research new technologies.
   - MFS does not use technology in preventive and reactive messaging apart from the alert system that is in progress, and doesn't have any particular plans to use technology.
   - Fire Engineers at MFS create safety programs target young people. They do targeted presentations to different groups based on location, occupation, age. They target mainly older people and young kids. They also have programs in schools. They don't target the age group 15-29 specifically.
   - Effective technological methods of reaching people would be
     - Mobiles, because everyone has one;
     - Radio frequency – reach people through their radio receiver; manufacturers have to be involved;
     - Computer systems in the office building – when a fire alarm goes, messages go on screens
     - Devices or system that gives info to people with disabilities – e.g. headphones;
     - Present the information at open public spaces as well as in buildings.
   - There is an alert system in progress of development that the CFA is trialing. MFS considers it a good idea and it is pursued by agencies.
   - Contact the department of MFS that deals with community education; Amy Seppelt will send us a contact.
   - Will send out surveys

7.5.1.16 John Simmons – March 30, 2007

Interviewee: John Simmons
Company: Emergency Services Telecommunications Authority
Position: CAD Software Review Project Officer
Interviewers: Victor & Diana
Interview date: March 30, 2007

1. **Introduction:**
    a. Description and purpose of the project
    b. Goals of the project

2. **Questions and comments by WPI students**
    a. Do you know about anything that has been done regarding using technology for community safety messages?
    b. What do you know about mobile phone networks (how they work, what types of communication are accessible)?
    c. What you can tell us about landline warnings?
    d. What possibilities are there for SMS messaging?
    e. How easy is it to target specific areas?
    f. Two different types of messages (SMS and GSM > Global short message?)
    g. Since landline numbers are going down what are the alternatives to this type of warnings.
    h. Do you think a type of GSM would be more effective?
    i. Do you think 3G has future because of its multimedia capabilities (maps, distances)?

3. **Responses and Information Gathered:**
    - There was a community information and warning system in 2005 done by Telstra
    - It is a web-based interface for emergencies
    - SMS or fixed-line phone call communicates the emergency
    - Telstra can contact anyone in Australia from one single point
    - Their database allows them to contact anyone through landline telephones
    - SMS
    - California and Victoria cooperate with each other with their bushfire experiences
    - There was also a trial in metropolitan Melbourne around a chemical company
    - The main reason people keep their fixed-line connections is because of dial up internet
    - New generation of mobile phones will have GPS (Global positioning system)
    - iPhone will have a great potential due its good user interface
    - GSM – Global Systems Mobile, it is the European standard for

messaging

- 3G has potential for displaying maps and more interactive interfaces for warning messages
- SMS is a limited medium. Newer methods of messaging will replace it shortly with better coverage.

7.5.1.17 Allan Eades – April 5, 2007

Interviewee: Allan Eades
Company: Telstra
Position: Telephone Warning System Consultant
Interviewers: Stacie, Diana
Interview date: April 5, 2007

1. **Introduction:**
   a. Description and purpose of the project
   b. Goals of the project

2. **Questions:**
   a. What can you tell us about the Telstra early warning system?
   b. What is different about this system compared to other systems (IDA)?
   c. What are some specifics about how the system works?

3. **Responses and Information Gathered:**
   - Worked through OESC for Telstra early warning trial – goal is to establish a national warning system for all hazards
     - Message consists of an audible announcement with the emergency message
     - A sufficient early warning system could reduce economic losses by 60%
   - There is no system of its kind anywhere else in the world – there are other systems that but they do not do all of the same things through one system.
   - Most emergency alert system (EAS) messages on radio and television are ineffective
     - In a television message, only 9% of those affected saw the message and the majority did nothing about the situation.
   - Need a credible source of information in order for a message to be effectively delivered to the people.
   - Delivering messages to only the affected part of the population is always more effective than delivering messages to the entire population.
   - There is no way to know if correct information gets to people at the correct time – recognition of the problem is the primary issue.
   - Government is concerned with promotion of mutual obligation between people and emergency services, community-centric thinking.
   - There is approximately $11 billion dollars per year worth of damage, mainly property damage due to floods.
   - Interagency and cross jurisdictional cooperation is important.
   - Important to understand key segments of marketing based management.
   - Message construction is important to deliver an effective message.
   - Multiple delivery methods for the same message would be most effective.
   - Telstra early warning system is intended to merge a phone and address list for all fixed and mobile phone numbers as well as mobile base stations in order to "tell" the system which other mobile are working off of a tower in the affected area

    - Phone number (integrated public number database - IPND) and address database
    - Delivery to all fixed number phones will be guaranteed
    - Feedback about message confirmation (from fixed line phones) will be provided
- System would not be opt-in, but rather messages would be sent to all affected phone numbers.
- Mobile towers in the area would send information back to Telstra who would then send a message out to those mobiles.
    - Geo-spatial triggers to identify coordinates of mobiles are updated every 20 minutes.
- Currently only Telstra participates, but they will ask other mobile carriers to participate.
- There will be waves of take-up of the system by the people, and initial deployment is the most risky wave.
- The frequency and severity of incidents has increased recently so the system is necessary.
- Improvements to the Internet (such as fiber optics) will be implemented "fairly soon" but they are waiting for government cooperation – approximately 3 years, definitely by 2015.
- Next G / 3G will be further developed in the future, possibility of 4G or 5G which could lead to video streaming information.

7.5.1.18 Bernard Salt – April 5, 2007

Interviewee: Bernard Salt
Company: KPMG
Position: Demographics Specialist and Market Analyst
Interviewers: Larissa, Diana, Stacie, Victor
Interview date: April 5, 2007

1. **Introduction**
   a. Description and purpose of the project
   b. Goals of the project

2. **Questions:**
   - Can you tell us about trends in technology usage of technology by young demographics?
   - What kind of devices or services will young people look for in Australia?
   - Do you know the level of awareness of young demographics with respect to safety messages (fire alerts, skin cancer)
   - What do young demographics do to communicate with friends and family?
   - How much time do they spend communicating?
   - What sort of differences are there within the 15 to 29 age interval?
   - What is the budget of this age group to spend on technology?
   - What do young people search for in television, radio, and Internet?
   - Can community messages be integrated to what they listen, read, or watch?

3. **Responses and Information Gathered:**:
   - Trends in technology
     - Similar to the trends in the United States
     - Leading technology for young people is mobile phones and mobile phones and Internet.
     - Young generations adopted technology as a part of their social structures. Older generations use it in the work environment.
     - Young people also adopted their own language in regards to their technology – SMS text is such an example. Kobalt has been the tech language 30 years ago.
     - Mobiles are also a part of the individual's persona for young people; if one separates them from their mobile phone they get anxious. It is the one piece not attached to ones body that follows them everywhere they go. Mobiles say something about a person's personality e.g. Nokia's fashion mobiles.
   - Future trends in technology
     - Integration of multiple functions in one - personal communication device. The interaction will be far more than communication – entertainment, storage etc. This device will be young people's companion, their portal to friends, family and workplace. It will have a range of services that are packed in one simple device.
   - Adaptability of technology

    - The thing that drives young people to a technology is universality. If it is universally acceptable and everyone is using it, they would want it. Another factor is price – they need to be cheap.
    - Three main values of Generation Y (Gen Y) are: broad, low cost, instant.
    - Real time is an invention of GenY. They are the drivers rather than message. This generation is used to pop-ups and spam.
    - Messages will be effective if they are differentiated from spam and are interesting amusing, and compelling.
- Attitude of Gen Y to safety messages
    - When people are in their 20s they are invincible, they are never going to die.
    - Gen Y are a little more conservative and practical. Things like safe sex and drink driving were not issues in preceding generations. They and even gambling are the new taboos.
    - Environmental concern is new as well. Gen Y is quite receptive to instruction on how to minimize their effect to the environment. If they are receptive to that they should be receptive to fire messages as well, as long as they are sent in an appropriate way.
    - Cigarette smoking has probably declined and that is a consequence of the messages. Young people are far more responsible as a consequence of safety messages.
- Differences within Gen Y
    - There might be, but they are not apparent to him. They are probably more visible to someone in Gen Y. The differences are more subtle.
    - There is not really too much need to split the group as far as the actual message is concerned - it shouldn't be too complicated, it is the same message: safety security, you'll die.
- Differences in communication
    - Gen Y people come from small families where both parents work. The parents are indulgent of their kids, because they have to work and they give everything to them.
    - Gen Y has recreated the family in their friend group.
    - Gen Y has formed a very strong friendship groups. A proof of that are television programs like Friends, which stroke a cord in the market because it was a group of friends versus the Brady Bunch, which was family in the past.
    - Gen Y connects through their tribe. The way to connect to Gen Y is to connect through their tribe – make it "cool" for the group. Friendship and social connections are very important among this generation.
    - What makes something "cool"?
        - Being the latest.
        - Being able to do something that no one else can do.
        - Being better.
        - Allowing a Gen Y person to find a path that is unique which they can then show to their group. "You don't know how to do it? No? Here's how you do it."
        - Using technology in the smartest most innovative group.
- How much would Gen Y spend on technology

    - It depends. Here's where young and old Gen Y's separate due to access to money.
    - Example: A new version of Playstation costs $750 US. This is a toy! That is not aimed at the 16 year old kids, but to their guilt struck parents. At the younger level $1000 is not unreasonable. Also mobiles are all payable by parents. So parents end up paying US $3000 per year.
    - 25-29 year olds have their own budget, so the sky is the limit. Their spending capability is much bigger.
- Delivery methods and content of messages in regards to Gen Y
    - Baby boomers were looking for idealism reflected through the media, so in the 70s there was an ideal notion of suburban life. For example in the television show Bewitched the main character Samantha was perfect; In the Brady Bunch everything is tweaked and they are one big happy family. Nowadays there are a large amount of reality shows such as: Real World, Biggest Loser, Survivor and Top Model. These are especially popular among young people.
    - Gen Y does not like sugar-coated things. In the past people looked at television programs as role models and projected their aspirations to that television programs. 30 years later, people have a whole generation brought up on television. It is far more cynical, just because they are fed CNN 24/7 so young kids know things that people did not know before. Idealism is broken down.
    - Gen Y want real and immediate stuff. They want reality television. Programs have to be real, immediate, and not manufactured. It's a 180 degrees change from artificial to brutal and edgy. Show today are not "plastic".
    - Graphical messages would be a good way to reach young people. The Traffic Accident Commission (TAC) has some real shocking commercials.
    - "People have become desensitized, because in a movie you know it's not real, but in an accident, when the music is not there, you know it's real. And that connects. That might be true for the whole society. They have become so jaded with fake stuff that they want what is real."
- Urban versus rural areas:
    - Due to bushfires people in rural areas are more risk aware. It is what they have grown up with. It is part of their culture and everyday life.
    - Every 20 to 30 year communities will have a great fire and this would mark a generation for 30 years. For example in 1983 Ash Wednesday. 23 years later even the young generation knows about it.
    - In urban areas risk messages are not as immediate, so not as important. People in urban areas are more worried about other things so they are not as receptive.

7.5.1.19 Christine Jenkinson et. al. – April 11, 2007

Interviewees:
Christine Jenkinson – Assistant Director Knowledge Management
Trevor Jenner – Manager Technical Assistance
Melanie Ashby – Manager School Education
Heidi Ellemor – Research and Coordination
Company: Emergency Management Australia, Mount Macedon, Victoria
Interviewers: Victor & Diana
Interview date: April 11th, 2007

1. **Introduction:**
    a. Description and purpose of the project
    b. Goals of the project

2. **Questions and comments by WPI students:**
    a. Can you tell us more about the EMA Tsunami Warning system
    b. How do you send the message? Who do you send it to?
    c. What's the message?
    d. Has the agency encountered problems with messaging a big group of people?
    e. Have you noticed a trend in the number of volunteers? Where are they from? Are there regions that are more aware?
    f. Do you think people who have gone through an accident are more aware?
    g. Do you somehow keep track of how many people have looked or downloaded the online materials that you have?
    h. EMA has done a lot of research in the areas of community education. Can you tell us which methods are most effective based on your experience?

3. **Responses and Information Gathered:**
    - Technological work blends with conveying warning messages.
    - It is important to use the technology available in case of a disaster
    - The International Telecommunications Union which works with television and radio content development within the United Nations sets international standard for the dissemination of warning messages
    - Japan and Korea are probably the two most successful countries in conveying safety messages
    - Next Gen networks and future technologies bring challenges and possibilities for conveying safety messages
    - EMA has not done previous work within the 15 to 30 year old age interval, however they have worked with culturally and diverse communities.
    - Cyclone Larry brought a great challenge to improve the resilience of emergency communications networks
    - SMS messages providing alert systems outside the Emergency Services are not always legal

- ACMA is the regulator, however, there is no policy or regime in place to deal with private providers of SMS warning messages
- In a fire situation the network can go down
- SMS warning providers get their information from official agencies and then disseminate it to their subscribers
- It is important to analyze what happens at the community level, because every person reacts to an emergency message in a different way
- Research will be made as to how many private SMS providers there are and where they are located
- In order to use cell broadcast a geographic area has to be located. In this case, the message does not go back to the server and the user's mobile phone has to be on
- Example of a cell broadcast: during the fire in one of Melbourne's tunnel, towers around the area could be located and then mass SMS messages could have delivered to drivers going in the tunnel.
- IT networks will be able to wake up turned off computers and televisions to convey warning messages
- Develop information resources around natural disasters for primary school education
- Engage youth in the process of risk management
- Emergency language has to be changed in order to reach young demographics
- People had not heard about the Tsunami warning or were not worried about it
- There is a general lack of concern in youth
- A recommendation after the cyclone was that people should have an old-fashioned transistor radio because the networks for regular radio, television and Internet were damaged
- There was hoax in Melbourne. Someone broke in the network and sent alert messages. Due to this incident confidence was lost

7.5.2 Focus Groups Minutes

7.5.2.1 NSWRFS – March 22, 2007

NSW Rural Fire Service
Date: March 22, 2007 at 4:00pm
Participants: 6 Fire Volunteers: Cleland, Ryan, David, Angus, Alex, Chris
Age: 23-28 year olds

Educating the Public about Fires:
The population of Australia resides within a small area of the continent. About 70% of people live on an urban-rural interface, therefore wildfire safety is a big issue. Living in a wildfire prone area and being exposed to the risk should make people want to learn about fires. However, most people are not too concerned until they have experienced a fire. Fire safety education starts at a young age. Children begin learning about fire safety as soon as they start going to school. A common message for younger children is the motto: "get down low and go, go, go!"

Fire Safety Messages:
"If you asked most people about a fire safety message, they will probably tell you they haven't heard any."
A common fire safety message example is the one related to day light savings time stating that when you turn your clocks back, replace your smoke alarm batteries.
"The information is there, if people want it they will get it. You can't force feed and spoon it to people." People won't take the message seriously unless they specifically want the message. It is kind of like the same situation with preventing skin cancer in Australia.

Preventative vs. Reactive Messages:
Reactive and preventative messages are different. It is harder to communicate messages about general safety & prevention. If there is information people want to get they will turn on the radio or television.

Delivery Methods:
People signed up for the incident alert systems only look at it when there is a disaster. People will not be willing to pay for fire alert service; cost will hinder success.
NSW has a website with a fire map.

Targeted Age Group:
This particular age group is not usually targeted in regards to fire safety messages.

How to reach the targeted Age Group:
The targeted age group should be broken down into smaller age groups.
25-29 year olds are usually starting to settle down. It might be possible to intertwine

safety messages into investments, property, and insurance.
Look at successful marketing for specific age groups, and then manipulate the marketing to convey the message. Multimedia messaging, combining the message with something the targeted group is interested in; for young people: cars and sex appeal sells.

Using Technology to Communicate Fire Safety Messages:
New technology provides new forms of media to use for communicating messages. However, if fire safety messages appeared all over the place all the time "they would become like spam mail."

- **Television**
  The television is the most common delivery method. People do not pay much attention to commercials, rather they flip the channel, mute it, or get up and do something. It was suggested that instead of commercials doing an unexpected 10 second safety message in the middle of a television show. Mobile text messages, PDA alerts, internet popups are easy to deleted and ignore, whereas it is less easy to avoid a message on the television. The television is the best way to force the message upon people.

- **Radio**
  Broadcasting is done over the radio for car accidents, road closures, etc.

- **Mobile Phones**
  Text messages would not be an effective method of delivering safety messages. If people get a text message from a fire safety organization they will just delete it and not read it.

- **iPods**
  Sending messages to iPods, might be seen as an invasion of privacy.

- **Posters, ads, visual Media**
  Advertising in public places and on public transportation is a standard method. Putting messages in odd places such as pubs, coasters, public bathrooms would draw attention to them. It might be useful to consider advertising where to find fire safety info ex. websites, and organization names, instead of the info itself. Shock advertising of safety campaigns draws attention.

- **Video Games:**
  Video games are popular among the younger generations but it is not likely that people are not going to want to play educational video games. There is a fine line between fun & education in games. Most kids look for danger in games, not ways to avoid it. Is the correct message going to be perceived? Young kids are rebellious and like to be mischievous. "If I was a kid and playing a game to save the lives of people, I would do the exact opposite and kill everyone." Having a

game about fire safety could twist the message around.
The use of some sort of quiz would be a better idea, in which people have to watch a video and answer questions about fire safety and then they could win a prize.
People don't like doing something for nothing, so there has to be some form of encouragement. Saving your own life is a big encouragement but it still isn't enough for many people. People watch the news, they see the danger, the tragedies, they say what a shame- too bad, forget about it and then see the same thing happen again a few days later but it doesn't necessarily change their behavior.

7.5.2.2 NSWFB

NSW Fire Brigades
Date: March 22, 2007 at 7:30pm
Participants: 9 Firefighters
Ages: 20-30 years old

Technology Usage:
Mobile phones are the predominant form of communication technology used. Mobile text messaging is preferred over mobile calling.
Mobiles with built in music player are preferable: "the less you have to carry the better"
Better Internet is a capabilities many people want to see with new technology.
Only 1/3 have heard of Apple's new iPhone but they all seemed to be interested in it.
The Internet is used to look up information and email, usually once a day.

Safety Message on Mobile Phones:
If safety messages were delivered to mobile devices people would skim the message and delete it. People would only read a short text message, if it is long and boring, it would just get deleted. An informative message about a fire occurring would be useful but receiving preventative messages would not be desired.
Info should be relevant to what you are currently doing. For example you would not want to receive a message saying "swim between the flags" if you are nowhere near the beach and it the middle of the winter.

How to deliver community messages:

- **Television**
  Younger generations are more apt to pay attention to message displayed on television than a text received on a mobile phone. Best way to get through is an ad on the television because you cannot delete it. Playing safety messages during the previews before movies might also work.

- **Radio**
  The radio is also a good way of communicating messages to people. If listening to the radio and a safety message comes on people will hear it.

- **Internet**
  Popups on the Internet are annoying, people close the window right away, or have popup blockers.

- **Video games**
  Younger kids like to play video games however a game aimed at encouraging fire safety could be contradictive because video games are usually violent or destructive.

- **Posters, ads, visual media**

Posters and ads in public places are usually viewed quiet often. Visual messages capture people's attention. Think of what images grab the attention of the target age group, ex: cars, celebrities, drugs, "chicks"

Interest in a delivery service that alerts people when a fire occurs:
This type of service is convenient. The radio and television can alert you of this, however if you are not currently watching television or listening to the radio receiving a text or message on a mobile or iPod would be a good idea.

Reaching the Target Age- Group:
After the age of 20, people (especially guys) think they are bullet proof and have an arrogant "that won't happen to me" attitude.
Fire education must be started at a young age. Children are targeted in primary school through high school, and then the focus jumps to adults. Fires caused by teens are usually alcohol or drug related. Messages geared at younger people need to be an "in your face" type of message, perhaps graphic or shocking, for example real-life incidences of teens involved in fires.

7.5.2.3CFA volunteers – March 27, 2007

CFA
Date: March 27, 2007 at 7:00pm
Participants: 3 Senior Volunteers and 1 Junior
Ages: 15- 18 years old

Technology Usage:
Mobile phones
Mobile phones are the most popular device.
All 4 of the teenagers have a mobile phone, and use it more than any other device on a daily basis. Mobile phones are small and convenient. Bongo is an Australian mobile SMS message information service. You send a question in text to the number and it replies to your question within a few minutes. The service costs $3.00 to sign up for unlimited usage.

iPods
iPods are used to listen to music mainly when traveling and during school.
Half of the group had heard of the new iPhone. They all seemed interested in it, but said they would only buy it if it were cheap enough.

Internet
The Internet is not used as much as it in the city due to the slow connection speed and limited coverage. There is broadband internet in the schools, but students are only allowed to use it for education purposes.

Video games
Video games are not a big thing either. Teenagers don't have to play video because they are busy with school, and other activities.

Fire Safety Education in School:
In primary school students are educated about fire and fire safety. Education includes the following topics: grass and scrub fires, what to do in the event of a fire, having a family fire escape plan at home, mottos such as "stop, drop, and roll" and "get down low, and go, go, go!" and reminders such as change your clock- change your smoke alarm batteries. Smoke house is used in schools and by fire organizations to help educate young children. Smoke house is designed as a simulation of a house fire. The trailer is set up like a home, and fake nontoxic smoke is released into the rooms. The idea of is to teach children what they should do when a fire occurs and how to safely escape.

Safety Messages:
Examples of safety messages: safe driving, change smoke alarm batteries.
Besides from info from the CFA safety messages are usually found on the television, radio or in visual forms- posters, ads.

It would be helpful to receive the following types of messages:

- alert when a big wildfire occurs
- reminders about fire bans and fire restrictions
- preventative messages- ex. what to do if a fire occurs

However, these types of messages should not be sent out too often (perhaps one message every week or so). Sending these types of messages through mobile devices would be a good idea. It might be a problem in some areas because of bad mobile reception and coverage. Text messages are preferred over graphics/videos because they are easy to read, and receive. People should sign up for the service and be able to select the areas they live in or want to receive information on. Messages should be relevant to the wildfire seasons and pertinent to the area in which people are located.
Ads and posters in public places are a good idea. Examples: buses, classrooms, school hallways, restrooms, doctors waiting office, prep-school doors.

7.5.2.4Clematis – April 3, 2007

Clematis Fire Brigade
Date: April 3, 2007 at 7:30pm
Participants: 8 Fire Volunteers
Age: 15-20 years old

Methods of communication:
The most popular technologies are mobile phones and Internet. Most people use it primarily for text messaging. Some people use it only for phone calls. Landline is used rarely. Other methods of communication are MySpace (the 8 volunteers had an account) and MSN Messenger.

Messages that get people's attention:
Things that would catch people's attention are graphical things that scare them; things that they care about or are among their interests; a catchy phrase (If you drive drunk you are a bloody idiot); messages heard while doing something you enjoy. Overall people who have grown up in that area are good with messages and when they hear one are relatively aware of it and evaluate the benefit over the risk. Messages related to a trigger can be useful in the short run, but 3 weeks later, they don't change a person's behavior. Also messages that are repeated too many times are good, before they become annoying.

SMS messaging:
People would read it only if it is important, for example, if there is a disaster. Otherwise they would just delete it. It is better if the message is sent by some number that people recognize as an authority, such as 000, as long as no one else can do the same thing. However, if there are too many messages sent from the number people will get annoyed. Therefore, the messages sent should be relevant.

Alert Systems:
Alerts are good only for big catastrophes. Otherwise people consider them unnecessary, because they know about the CFA website where they can get all the information. They wouldn't sign up if they have to pay, unless it really relevant.

Games:
Making an educational game that is also interested would be hard. A fire safety game that is with educational value might be of interest to the young kids who want to be fire fighters when they grow up. There are some games like that such as Roller Coaster.

Device usage in the future:
People would use GPS or devices that combine many functionalities in one, such as a pager and a telephone.

MySpace:
People wouldn't mind receiving fire safety messages, but only if they are for their area. For example, if MySpace can send messages based on the address or region which the use has provided, that would be useful. Only if messages are relevant.

Need for safety messages:
People have received plenty of messages while in primary school and they have been plenty useful. They are aware of the issues and don't need to receive more information. People who have grown up in that area generally don't need to hear more. It has become an instinct for them.

Message effectiveness:
What would make a message effective is if it shows the consequences of a person's action. People hear a message and it changes their behavior only if it has happened to them or to someone they know. And even then sometimes there is no effect. Basically a message is effective only if you hear it at the right time, e.g. right before you go to bed and you hear that you should light off the candles, check the stove and things like that.

Television:
People definitely watch less television than before, because they have no free time. Internet is somewhat the reason they watch less television. They also prefer chatting on MSN or using MySpace.

7.5.2.5CFS Volunteers – April 14, 2007

CFS
Date: April 3, 2007 at 10:00am
Participants: 5 Junior Volunteers
Ages: 15-16 years old

Methods of communication:
SMS messaging, mobile calling, and MSN messenger, and email are the most popular ways to communicate with peers and friends.

Mobile phones:
All mobiles should have cameras, video, directions (GPS) in the future. They use Internet mostly for general web surfing and school research. Ipods are not a desirable way of receiving community safety messages.

Television:
Television is now used less than before, however, it is still used every day. Most of the volunteers watch only television during the night. They do not use www.YouTube.com to watch television content

Community safety messages:
The volunteers have seen fire safety, speeding, and smoking safety messages. Vivid and impacting images make them more aware of the content of the message. Personal experiences might also change the behavior of the public.

Video games:
Video games might be successful if they can make a fire hazard appeal to young demographics

Advertising:
McDonalds, Hungry Jacks, and KFC are popular places where advertising can be placed.
Billboards with phrases catch their attention

Brand names:
Conveying safety messages by means of famous brand names could be successful. The respondents mentioned Nike, Adidas, and Fila as their favorites

7.5.2.6Swinburne University – April 16, 2007

Swinburne University TAFE students
Date: April 16, 2007 at 1:30pm
Participants: 4 students
Age: 20-28 years old

Methods of communication:

The most popular technologies are mobile phones and Internet, followed by television.
The students do not have wired phone lines, and only have their mobiles for phones.
One watched television more than the other two.
Television is seen as a habit, with the participants watching it more when they were in grade 5 or 6.
Television has been replaced by DVD's and video games.
Television tuner for the computer is a gaining popularity. The tuner uses cable but uses the computer to record.
The computer has replaced the television, most likely because the computer is more interactive and fun than television. The computer is also more social with messaging, playing games with others, etc.
One students lives in a house with others, and they use computers as a bill pay system.
Email is easier than sending a memo, calling someone, or simply getting up and walking to the next cubicle (in an office setting)

Fire Safety:

People in the country will definitely be more aware of fire, having a plan of action or house exit plan as fires are more prevalent in the rural areas. The city people are not as aware of fire. Immigrants are less aware of the fire dangers.
Young people do not respect the damage that fire can cause, do not see it as much of an issue, and they do not think ahead.
Possible messages: there are graphic car accident commercials that are remembered because they are graphic, so maybe something similar with fire would be effective.
Preventive messages are important, but many people do not pay attention, so that is the hardest part.
Newspapers, television, radio, and school programs for children are all used and are useful for the younger age group.
Many people want to watch television or listen to the radio to learn about an event/issue so a possible delivery method could be to send a message telling people to turn into the television or radio.
Email as a message delivery method is not useful unless the person is at the computer.
Radio is useful because it constantly updates.
Video games may be useful for young children, but many people have destructive tendencies rather than wanting to fix something.
Message repetition over time is important, as well as hearing messages from home (at a young age) – the formative years are more important.

Print ads would be effective in schools, possible workplaces, and busses because there is a captive audience. Having a multi-method approach is effective, such as print ads and television ads with the same message.

7.5.2.7RMIT Students – April 17, 2007

RMIT
Date: April 17, 2007 at 1:30pm
Participants: 6 University Students
Age: 17-19 years old

Methods of communication:
The focus group members use predominantly their mobiles to communicate with others. They identified messaging as the preferred method of contacting people, because it is cheaper and it doesn't require both people to be free at the same time, i.e. they can read their messages when they are free. When asked whether they think that text messaging is "cool", they said that it's not relevant. After mobile phones, they use MSN messenger the most.

Getting people's attention:
Overall the things that get their attention are things that are different and new. An example that came up during the conversation was the big LCD screen in Melbourne. They also identified that they notice things when they see them on television.

Perception of community safety messages:
Some of the community safety messages identified by the group were regarding fire plans, water restrictions, traffic messages, smoking, and cancer. They said that the grosser they are, the more effective they get. Of the messages they have heard "Drink. Drive. Bloody Idiot" was the one all of them remembered and identified as catchy and memorable. The focus group also suggested that the best commercials are the footy game ones. It is important for messages to be relevant, because otherwise they are annoying.

Effective delivery methods:
The most memorable messages they identified were those with catchy slogans. The focus group members also suggested that graphical and visual stuff is memorable and also could lead to a change of behavior. The issue is that people are desensitized and they react if they see more graphical things. However, there should be a limit to how much is shown. The Queensland Government has an ad that is too graphical.
The group members also identified that beer commercials are really good and it would be good if fire safety messages were like them. What they liked in them was that the commercials are funny and original, and not that they are of beer.

SMS messaging:
If people are sent educational messages, they would hate it. However, if they are in the forms of alert, they would be very useful, in particular because sometimes alarms are not enough and the information has to get to more people. The information has to come from a credible resource which cannot be "hacked". An idea is to be able to turn phones on if they are off, if they receive an alert message.

The group found the idea of receiving a message that contains an exit plan as good, if it can be personalized to the different people's needs. They also suggested that people would check their phones if they knew that they'll get more information on where the fire exits are.

Bush areas, alert websites:
Having an alert system is a good idea. The group identified that a message that tells you where you can find more information, especially when you can't call the fire services, because all the phone lines are busy. E-mail probably won't be as good.

Video and online games:
Overall the focus group members indicated that they would not play an educational game, but often play other games. One of the group members has actually played a fire game and liked it. They thought that those type of games are more appropriate for primary school. They also liked the idea of fire messages being part of a SimCity type of game. The group suggested that if there is a patch about fire safety in the World of Warcraft that would reach a lot of people. The topic of destructive behavior being predominant in games was discussed and the students identified that even if the player does everything wrong he or she will still get something out of it, and would be more aware.
In-game-advertising was another topic that was discussed and people reacted by saying that the player wouldn't pay too much attention to it. However, if it is something short and catchy the player won't pay too much attention to it, but it will stay in the back of his or her mind.

MySpace:
The focus group members found the idea of a MySpace account of CFA interesting, but expressed concern regarding how many people would add CFA as a friend, and how many would perceive it as spam. Overall if there was a way to have messages through MySpace that would be good.

YouTube:
The members indicated that if the video is funny they will watch it and they believed it would be seen by a lot of people. They also like the ideas of watching television online with only their favorite shows.

iPod:
Having messages sent to people's iPods was considered a great idea, if it is a message about an eminent danger. The group members found it important due to the fact that in case of an emergency the people who are listening to their iPod or other mp3 player, won't hear sirens or anything going on around them. So if there is a way to tune in to their iPod that would be very helpful.

Printed Media:
Lastly, printed media methods were suggested by the focus group as effective delivery

methods. Some of the examples were the bulleting board on Melbourne Central, other big bulletin boards, street signs, etc. Most importantly the messages have to be eye catchy and changing.

7.6 Appendix F

Cross Tab Tables

7.6.1 Facebook and MySpace Cross Tab

Table 35 Facebook MySpace Cross Tab

Percentages	Facebook						
MySpace	Never	Once a month	Once a week	Several times a week	Every day	Multiple times a day	Grand Total
Never	51	1	1	2	2	1	58
Once a month	7	2	0	0	0	0	10
Once a week	6	0	1	1	0	1	8
Several times a week	7	1	1	1	1	0	9
Every day	5	1	1	1	0	0	6
Multiple times a day	7	0	1	0	0	1	9
Grand Total	82	4	4	5	2	3	100

7.6.2 Mobile Calling and Mobile Text Messaging Cross Tab

Table 36 Mobile Calling, Mobile Texting Cross Tab

Percentage	Mobile Text messaging						
Mobile calling	Never	Once a month	Once a week	Several times per week	Every day	Multiple times per day	Grand Total
Never	1	0	0	0	0	0	2
Once a month	0	0	0	0	1	1	2
Once a week	0	0	0	1	1	0	1
Several times per week	0	1	1	4	4	3	13
Every day	1	0	1	5	16	7	30
Multiple times per day	0	1	1	4	6	42	53
Grand Total	2	3	3	14	26	53	100

7.6.3 Traditional Media and Received Safety Messages Cross Tab

Table 37 Traditional Media, Received Messages Cross Tab

Percentage	Yes/No			
Traditional Media	**Yes**	**No**	**Grand Total**	
Never	**1**	**2**	**3**	**33**
Once a month	**1**	**2**	**3**	**25**
Once a week	**1**	**3**	**4**	**19**
Several times per week	**5**	**12**	**17**	**30**
Every day	**9**	**18**	**27**	**33**
Multiple times per day	**17**	**28**	**46**	**38**
Grand Total	**34**	**66**	**100**	**395**