

Design and Implementation of Precautionary Controller for Mobile Phone Accidents While Driving

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ABSTRACT

Mobile phone usage is increasing worldwide in recent years, with more than 700 million subscribers in India one step behind China as of July 2012. Considering the risk associated with usage of mobile phones while driving, India is way ahead of China. According to World Health Organization (WHO) in its first ever Global Status Report on road safety says, India has recorded maximum number of road accidents in the planet which also accounts on population growth. According to Indian National Crime Records Bureau at least 15 people dies every hour in road accidents. Various statistics also reveal that a large portion of road accidents in India is caused due to mobile phone usage while driving. Although various measures and rules imposed on mobile phone usage, still it's highly impractical to prevent this type of events. In order to overcome this serious issue, we developed an application which helps in reducing the number of mobile accidents considerably and we further extend our research by comparing the obtained results after installing this application, we have also shown how far this application helps in reducing economic losses in India.

Keywords :- Mobile Phone Accidents, Usage Of Mobile Phones While Driving, Accidents In India Due To Mobile Phone Usage, Hazard, Risk, Distractions.

I. INTRODUCTION

Mobile phones can be an essential means of communication when we are away from the office or home and it can be an important security asset in the event of an emergency. However, there is a considerable concern that using a mobile phone while driving creates a significant accident risk to the user and to other people on the road, because it distract the driver, impairs there control of the vehicle and reduce their awareness of what is happening on the road around them.

II. DISTRACTION

Using a cell phone while driving, whether to talk or text, is a major distraction that causes accidents. Dialing and holding a phone while steering can be an immediate physical hazard, but the actual conversations always distract a driver attention. Distraction are broadly classified in to two categories 1) physical distraction and 2) cognitive distraction

III. MEASURES TAKEN BY GOVERNMENT

Initially, almost all the countries around the world bans the usage of hand-held devices while driving by considering the fact of deviation in driver's concentration and their physically incapacitated because of holding the phone to his ear, which slows reaction time and could result in accidents. During that time most of the countries are encouraged to use hand-free devices. Few years later, researchers found even the usage of hand-free doesn't show any improvements.

Later various studies carried out to establish the fact of risk involved in hand-free device. According to recent research from University of Sydney, it's proved that people talking on cell phones while driving are at least four times more likely to be involved in a collision and using a hands-free device does virtually nothing to reduce the risk. As of results of these types of studies, various governments from all part of the countries ban the hand-free devices too. In New Delhi, India use of cell phones when driving, including use with a hands-free unit was banned from 2001.

In-spite of these ban and various strict laws against cell phone use while drive in INDIA , Drivers are still unlikely to altogether give up using their cell phones while on the road due to various factors like.

- Users don't want to miss any emergency calls like business and personal
- Calling for help in a Medical Emergency

IV. THEORETICAL BACKGROUND

Researchers and scientists proposed various ways like developing a model or building an application to prevent the usage of mobile phone during driving. But still it has its own demerits.

Japanese patent application JP 10 233836 entitled "On Vehicle Portable Telephone /system" discloses a system and method where incoming calls received within a moving vehicle, when the vehicle exceeds a predefined speed limit, are directed to a voice mail system where the caller is closed. In this Japanese patent application, the objectives of emergency calls and risk associated with outgoing call are failed to deal with it. US Patent "Method for automatically switching a profile of a mobile phone "Discloses a method of measuring a current environmental noise value and compared with a predetermined noise value to calculate a noise difference. Switching a profile of the mobile phones based on the value of noise difference. In this patent user able to get call when struck in traffic signals, Risk of Outgoing call and emergency call are failed to deal with it.

V. METHODOLOGY

By keeping all the above facts from studies, we proposed a safest application which will significantly reduce the risk of mobile phone accident at the same time the user don't have any stress on missing emergency calls. This mobile application comprise various stages.

By capture the incoming call event and even before the phone rings, we block the call at the 1st time. Send the voice message to the caller when the call is not being attended but prior the call is checked if "Emergency". Emergency call means the caller calls from the same number 3 times within 5min duration from the 1st call. The caller will receive a voice message during the 2nd call but during the 3rd time it will be recognized as an

"Emergency Call". The driver will be alarmed Emergency Call during the 3rd time in order to attend the call. When the driver attends the Emergency Call the vehicle is being controlled by the ignition control.

VI. INDIAN ECONOMIC IMPACT ON ACCIDENTS

As per data registered by the World Health Organization, nearly thirteen hundred thousand people are known to die each year in road accidents globally. Out of which more than one hundred and thirty five thousand people are killed in India roads. According t Indian National Crime Records Bureau at least 15 people die every hour in roads when compared to 13 in previous year. Due to coordinated interagency approaches in developed countries, the situation is improving. However, projections indicate that unless there is new strong political commitment to prevention, the crash death rate in low and middle income countries will double by 2020, reaching more than 2 million people per year. Road crash injuries impose substantial economic burdens on developing nations like India estimating 3 percent of gross national product.

The estimated cost includes compensation, asset loss, time and energy spent on police, hospital, court cases and work loss costs value productivity losses. They include victims lost wages and the replacement cost of lost household work, as well as fringe benefits and the administrative costs of processing compensation for lost earnings through litigation, insurance, or public welfare programs like food stamps and supplemental security income. As well as victim work losses from death or permanent disability and from short-term disability, this category includes work losses by family and friends who are for sick children travel delay for uninjured travelers that results from transportation crashes and the injuries they cause, and employer productivity losses caused by temporary or permanent worker absence (e.g. cost of hiring and training replacement workers).

TABLE I.

ESTIMATED NUMBER OF PEOPLE INJURED IN CRASHES AND PEOPLE INJURED IN DISTRACTION- AFFECTED CRASHES.

Estimated Number of People Injured in Crashes and People Injured in Distraction-Affected Crashes

Year	Total	Distraction	
		Estimate (% of Total Injured)	Cell Phone Use (% of People Injured in Distraction-Affected Crashes)
2010	2,239,000	416,000 (19%)	24,000 (6%)
2011	2,217,000	387,000 (17%)	21,000 (5%)
2012	2,362,000	421,000 (18%)	28,000 (7%)
2013	2,313,000	424,000 (18%)	34,000 (8%)

National Safety Council estimates that 28% of crashes are caused by the driver using his or her cell phone. Financial losses due to road accidents are close to 3% of our GDP every year as per BBC report. In India, so the total cost of losses due to road accidents was 820cr a day

According to NSC, total number crashes due to mobile phone usage while driving every day can be calculated as,

$$28\% \text{ of } 1589 = 445.$$

Therefore, 445 crash per day due to mobile phone usage while driving every day can be calculated as,

$$28\% \text{ of } 1589 = 445.$$

Therefore, 445 crash per day due to mobile phone usage. In India the total cost spent approx . '820cr per day for 1589 crashes as per the reports obtained from BBC and NSC. Hence '229.6cr spend for crashes involved in mobile phone usage. As discussed earlier, if we install this application mobile phone while driving the chances of involvement in crashes is 10% So, 10% of 445=44.5(Approx.45)

Hence we can save nearly 400 crashes which in turn reduce the economic loss of India to '620cr from '820cr and with improving personal family benefits. Hence nearly 1/4th of crashes and economic loss can be reduced.

VII. CONCLUSION

We conclude that the implementation of the above invention will help in reducing the risk if attending a call significantly and the risk associated with initiating or making a call to almost negligible. Though laws have been enacted banning use if mobile phones while driving in various countries including India but still the users are altogether not giving up of using cell phones

while on the road due to various reasons as discussed. At least by installing this application we can reduce the risk involved in mobile accidents significantly at the same time we can also reduce the economic losses by 1/4.

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