Safe Driving Score
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Slide 2 - User Profile

For large families safety is key. Safe driving is a particular concern for parents when it comes to their teens who are new to the road. When teenagers get behind the wheel for the first time and experience that newfound freedom, there is very little incentive for them to actually be careful. Not only are they new to the rules of the road, but teenagers are also the most likely to get distracted by their phones while driving. Parents are aware of the implied risks when their teenagers start to drive, but they can’t always be there to keep an eye on their teen’s driving.

Our prototypical user is therefore a family like the Matthews that values safe driving, but perhaps needs an easier way to make it happen. Mr. and Mrs. Matthews have no choice but to let Eric drive around on his own, but they also know how reckless their teenage son can be. They would like to know that he is being relatively safe, and if not, that there might be a way for him to want to be. Teens like Eric often need some sense of positive reinforcement; otherwise, there would be no reason for them to play by the rules.

The Problem:

The leading causes of all car accidents, especially for teen drivers, are distracted and careless driving habits. These include speeding, forgetting to use the turn signal, and not paying attention to stops. According to Jouney Safe outreach program, “Over 90% of teens admit to doing multiple tasks while driving, such as talking on the cell phone, eating, playing loud music, channel surfing, using mp3 players, and interacting with friends in the car even when they admit they find it distracting.” Thus it is clear that, in order to decrease the number of car accidents per year, a driver's interface should help prevent careless mistakes, decrease distractions, and
encourage the user to drive safer. Our approach to this problem gamifies driving by rewarding drivers for safe driving and by providing visual feedback on his/her performance in a non-intrusive manner.

**Slide 3- The Idea**

Safe Driving Score is a smartphone app that tracks the driver’s performance based on his/her safe driving habits. The user’s phone wirelessly syncs with the car to record the driver’s actions. While the user is driving, the phone rests on the dashboard and acts like a Heads Up Display, projecting icons onto the windshield that give the user instant feedback on his/her safe driving performance. This keeps the driver focused on driving safely while creating minimal distraction.

Based on the driver’s safety performance, the app calculates a Safe Driving Score (SD Score), which the owner can choose to submit to gain rewards from various insurance companies, consumer businesses, and invested organizations. Each driver is given a default starting score, which they can increase or decrease according to their driving performance. This score enables “safe driving” to be measured quantitatively and can have a number of applications from parents tracking teen driving to qualifying for insurance.

Multitasking while driving severely limits the driver’s situational awareness. In the matter of texting and/or calling while driving, Simon Hosking and associates at Monash University Accident Research Centre found that “drivers who use hand-held devices are 4 times more likely to get into crashes serious enough to injure themselves.” As a smartphone app, Safe Driving Score transforms the phone from a distraction into a driving aid. The goal of this app is to provide incentive for all drivers to be conscientious about how they drive and to minimize the number of accidents due to unsafe driving habits.
Slide 4 - Driving Mode and Log Mode

There are two modes in our app, Driving Mode and Log Mode. In Driving Mode, the phone provides immediate visual feedback to increase the driver’s situational awareness. The display shows three icons that we selected to minimize distraction. These icons represent the three most common causes of car accidents that are preventable by the driver. The first icon provides feedback on the driver’s turns and merges - anything that has to do with using the vehicle’s blinkers. The second icon provides feedback on the driver’s braking - whether they are made at appropriate times (stop signs, stoplights, behind other vehicles). The last icon provides feedback on whether or not the vehicle is traveling within a safe speed relative to the current speed limit.

When the driver isn’t driving, the phone goes into Log Mode, which - among other uses - allows the driver to review their recent driving activity under the “Recent” tab. Drivers can view trends in their driving in the “Averages” tab, from which they can deduce their strengths and weaknesses in their performances. Under the “Rewards” tab, drivers can view rewards that they qualify for, along with rewards within their reach. Their current score is always shown at the top of the display, along with their most recently earned points. Log Mode enables the driver to continually receive feedback on their performance even while they’re not driving.

Slide 5 - Color-coded Cues and Overriding Icons

This app is designed for both new and veteran drivers. Our research showed that the leading cause of car accidents is distracted driving. We concluded that this distractedness during driving occurs when drivers “zone out” during the drive and thus begin to do other tasks at once. To engage the driver in the driving task at hand, we took the theory of gamification and applied it to the driving experience. The first gaming aspect our app takes on is the immediate feedback on individual performance.

In this slide, teenaged son Eric Matthews gets to borrow Mrs. Matthews car. As a new
driver, he is glad that the SD app will aid him during the drive so that he can build the trust between him and and his mother. The more she trusts him, the more he will be able to borrow the car in the future.

As a new driver, there are so many different factors Eric needs to think about. At one point, he doesn’t even realize the traffic light is yellow, signaling him to slow down. The icons are all a default yellow. But as Eric’s speed remains the same as he approaches the light, the stop icon turns yellow. This tells him that he needs to prepare to stop or he will find himself in an unsafe situation. The color-coded cue gives Eric an immediate warning so that he can quickly respond before the situation gets dangerous. If Eric does not respond and ends up running a red light, he will be penalized - indicated by the icon turning red. A red icon simultaneously signals an unsafe situation and a deduction of points from Eric’s SD score.

We understand that there are several other situations that aren’t as common but can also lead to car accidents. Those situations are represented by their own easily identifiable icons. When that rare situation is about to occur, the respective icon overrides the default three. The slide shows that Eric is currently driving the wrong way on a one-way street. The wrong way icon has overridden the default icons and is now red. The longer the icon is red - meaning the longer Eric continues to drive the wrong way - the more points he will continue to lose. This overriding feature allows drivers to be informed of the most immediate, but not as common, dangers under their control.

Slide 6- Sending and Receiving Calls/Texts

Due to the increasing demand for rapid communication and cell phone usage, we recognize that users want to maintain access to their cellphones to communicate with others while in the car. Instead of depriving the user of this ability, Safe Driving Score allows the user to send and receive calls or texts as long as the phone remains on the dashboard and the user’s
hands on the steering wheel.

We considered the possibility that Eric might be running late to an event when his friend Sarah gives him a call to figure out where he is. Rather than give Sarah the impression that he forgot about the event, we decided that Eric should be able to use his phone to tell Sarah that he’s on his way without compromising his safety. Should the phone receive a call, the car will alert the user through the sound system and prompt him/her to respond orally, either answering or declining the call. By using voice commands, Eric can send and receive calls or texts without taking his eyes off the road or hands off the steering wheel. Deciding to communicate in this manner will result in a small increase in Eric’s Safe Driving Score. Should Eric decide to take the call by picking up the phone from the dashboard, however, an overriding icon will appear on the phone’s screen, warning him that he will begin to lose a large number of points should he not return the phone to the dashboard immediately.

Slide 7 - borrowing

Once we figured out the details of how our app could be used to aid drivers and to measure their safe driving habits, we then considered the applications of the safe driving score. With our primary user, Eric, in mind, we thought about the common situation in which someone asks to borrow your car. This is a particular concern for parents like Mr. and Mrs. Matthews who want to be sure that their children are in the hands of safe drivers. Often times teens like Jack will ask to drive their friends’ cars, and rather than get into an awkward situation, teens like Eric might just comply. We thought that the SD score could almost be used as a safeguard to protect Eric from situations like this one. As the owners of the car, Mr. and Mrs. Matthews can program in a minimum safety score so that only drivers who meet this standard may operate the vehicle. When Jack tries to sync his phone with the car, he finds he is unable to do so because his SD score is too low, and he is not a safe enough driver. It’s almost as if the driver is asked to
“log in” before they are able to drive, and the car owner has control of who may have access to their car. More importantly than the security of their vehicle, Mr. and Mrs. Matthews can make sure that Eric is in safe hands.

**Slide 8 - Customer Rewards**

The Safe Driving Score app opens a very large door for potential business partnerships. The example shown in this slide is a partnership with Starbucks that allows Starbucks to track safe drivers who are their loyal customers. After a certain number of visits to any Starbucks, drivers are rewarded with deals for future purchases.

The partnership would benefit Starbucks to ensure their customers continue to visit their shops rather than a competitor’s. The rewards also give customers incentive frequent Starbucks more often. Starbucks can also track driving routes of their loyal customers and work to perhaps open shops in more convenient locations to raise their revenue - all based on the data collected by SD Score.

Other businesses who would be interested in partnerships to access SD Score data would include car rental businesses and car-sharing services such as Wheelz and Zipcar. These are businesses that would want to ensure their customers are safe drivers.

**Slide 9 - Insurance Rewards**

We figured that the best incentive for safe driving would be in monetary form. People respond very well to positive feedback, and the promise of reward could be the push a lot of people need to drive safer. Since many people do get away with ignoring road laws, they probably ask why they should be bothered to drive more safely. The SD score can give them a very appealing answer that’s hard to ignore.

Drivers have the option of submitting their SD score to their auto insurance company to
receive benefits and bonuses. The SD score is almost like a credit score except that the driver is in complete control of who sees their score. The driver can choose whether to disclose the information to insurance companies and to be rewarded for their efforts as a result. These insurance benefits are a testament to the fact that drivers can only benefit from having an SD score.

This rewards system is a win-win situation for both the insurance companies and drivers. The insurance company is guaranteed to be insuring vehicles with only safe drivers. On the flip-side drivers are reducing their risk on the road and benefiting in their life off the road as a result.

Slide 10 - Driver Tracking

As the car’s owner, Mrs. Matthews is able to view Eric’s driving performance while he was driving her car. In “Recent Penalties”, she can see Eric was penalized for wrong-way driving within her car. In “Driver Averages”, she can also receive comparative reports on all the drivers that have driven her car. She sees the best driver, worst driver, the most common penalties and the drivers receiving those penalties. After seeing that Eric has a tendency to speed in her car, she has concrete statistics to help her address this concern with Eric.

For car-sharing businesses, this would also be a helpful tool for car-owners to receive a more accurate report of what their car has been through so they can make well-informed ratings on other drivers.

Slide 11 - Carpooling

Road congestion and traffic is a problem common to most urbanized areas. Parking lots can be dangerous and tricky to maneuver, drivers can grow irritated and aggressive, and the commuter’s time can increase dramatically. Some places such as Stanford University even pay
their staff to not drive their cars to work in favor of public transportation and carpooling.

As a professor of a university, Mr. Matthews uses Safe Driving Score when he commutes to work every morning to earn consumer reward points for carpooling or taking an alternate form of public transportation. Since Safe Driving Score is an app on his phone, his customer rewards account is tied to him wherever he goes, not just his car. Likewise it does not matter whether Mr. Matthews is the driver or the passenger, or whether Mr. Matthews is taking his car or another vehicle to earn points subsidized by the university. This feature is not limited to University subsidization. Any institutions that would benefit from fewer cars on the road are encouraged to offer rewards to their employees and customers for carpooling.

**Slide 12 - Modules**

Lastly, we considered our app’s potential for future growth and the possibility of expanding its functionality with additional modules. When choosing what kind of feedback to project through the heads up display, we picked the 3 most common causes of accidents. We realize though that not every driver may have or want to concern themselves with these measures. Since our intended user is a family, it made sense to cater to their safety needs first. However, we also wanted to make our product feasible for other user groups. For example, if a driver is environmentally conscious they may want to gauge their fuel efficiency and earn points according to this measure. By adding a module to their app, they can use the same heads-up display to receive feedback and points based on the fuel efficiency of their driving. Modules like this one allow the driver to customize the app based on their personal concerns, making the technology applicable to pretty much any user group. This model also allows partnerships for various companies and businesses who are willing to create a module for some particular measure and reward drivers accordingly.