Information Pieces for Expert Study
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Expected time to complete

Your team member knows how long certain things might take. For example, developing software programs vary depending on the scope of the software, the experience of the team members and the size of the team. On average, a mobile phone application might take around 4 to 6 months to complete, while a software program for your desktop or laptop tends to take 4 to 9 months. However, without clear constraints or changing recommendations, these development cycles can go for much longer.

Constructing any sort of physical solution that would change the architecture and infrastructure of the campus would take anywhere from 5 to 9 month. This would depend on a number of factors such as the location of the solution, how much legal documentation and processes you are required to go through, how much resistance there is to the idea and when construction would begin (which will usually be in summer due to less students being on campus). The duration of type of legal or policy change on campus differs greatly on the type of change proposed, how many people are in favor or against it, who needs to approve it and how well the change matches overall campus policy and goals. As such, this can take anywhere from a couple of weeks to several years.

Words: 216

Company culture

The company you work for has been around for a number of years. It grew quickly from a small team to a small company and has then been steadily expanding to a medium sized company to meet business needs. Revenue has had its ups and downs, like most other companies in the same field, but overall the prospects look good. The headquarters used to be in Lincoln, but a few years ago was moved to downtown Omaha because that is where most of the clients were.

Over time, the company has established a name for itself as a respectable company that consistently delivers value to its customers. One of the factors that is often attributed to the company's success is the way the company policies align with the company culture. The organizational processes, policies and structure reflect the values that the company was founded on and continues to stand by. The 5 core values are: Communication (Listen to better understand. Speak with people, not to them), Impact (Bias to action. Results over process), Curiosity (Actively seek out new skills and knowledge), Innovation (Challenge prevailing assumptions when warranted and suggest improvements. Generate new and useful ideas), Courage (Take smart risks. Question actions that are inconsistent with your values).

Words: 207

External

Phone usage in traffic

Your team member met with a subject matter expert on phone behavior to speak about phone usage and compiled discussion notes on people's attitudes around phone usage in general and in traffic. According to the expert, Americans generally consider it to be okay to use their cellphones when while walking down the street, riding public transit or waiting in line, but generally not okay during a family dinner or meeting, or in areas that are usually quiet spaces such as movie theatres or church.

The expert has looked deeper into this issue and found that the majority of smart phone usage, among all age groups, is when users are in bed or want to avoid being bored (or avoid other people), followed by usage on the toilet and in conjunction with another screen. Smart phones also play an important role in helping their owners navigate their environment and get where they need to go. Specifically, more than 60% of smartphone owners use their phones at least occasionally for turn-by-turn navigation while driving, with 31% saying that they do this "frequently." Smart phones are also used to get public transit information and to reserve a taxi service.

Words: 196

General smart phone usage

Your team has looked at several reports on phone usage in the United States to better understand who owns a phone, how often it is used, when and where. The general consensus is 95% of Americans own a cellphone, of which 77% are smartphones. Cell phone usage varies across gender (women: 75% versus men: 80%), age (65+: 46% versus 18-29: 94%), education (less than high school: 57% versus college: 91%), and location (rural: 65% versus urban: 83%).

Although the exact numbers vary, most reports indicate that people spend around 3-4 hours per day on their mobile phones. More than half of that time is spent on communication (texting, calling, emailing and social media), with the rest spent on entertainment, functional and photos. Additionally, smart phones are also used as a mobile GPS for real-time driving directions. Studies on actual usage seem inconclusive. One study on European countries specified that the number of drivers who use telephones while driving is between 1 and 11%, while another study declares that 4 out of 10 drivers use their mobile phones while driving in the car. Another study indicates that roughly half of all motorists use their phones while driving.

Words: 196

Domain Specific

About Omaha

With a population off around 450,000 people, Omaha is the largest city in the state of Nebraska and the 40th largest city in the U.S. The city area spans about 140 square miles, resulting in a population density of roughly 3100 people per square miles. Many of these inhabitants are commuters who must travel daily to reach their work. Additionally, traffic in the city at large also sees a large number of visitors from other places due to the large number of events and activities in the city, which cause additional traffic spikes.

To provide for the safe, environmentally compatible, and efficient movement of pedestrians, bicyclists, and motor vehicles, the City of Omaha Traffic Engineering Division is in charge of the design, construction, operation, and maintenance of traffic control systems. The Traffic Engineering staff maintains 120,000 traffic signs, administers 56,000 street lights, more than 1000 traffic signals, lane lights and flashers, 1160 lane miles of streets, and conducts 350 traffic studies and 600 traffic counts per year. This is a year-round task, especially since Omaha weather is known to fluctuate a lot with highs of over 90 °F and lows of -5°F. Additionally, the city is rather windy and sees an average of 26 inches of snow and 30 inches of rain per year.

Words: 214

Distracted driving

New technology in vehicles is causing us to become more distracted behind the wheel than ever before. Fifty-three percent of drivers believe if manufacturers put "infotainment" dashboards and hands-free technology in vehicles, they must be safe. And, with some state laws focusing on handheld bans, many drivers honestly believe they are making the safe choice by using a hands-free device. However, distracted driving occurs any time the driver is not focused on traffic or the road. This can happen any time the driver does not have their eyes on the road (visual distraction), their hands are off the wheel (manual distraction) and/or when their mind is not on the driving task (cognitive distraction).

As such, many distractions exist while driving, but cell phones are a top distraction because so many drivers use them for long periods of time each day. While using a cell phone might not seem like a big deal, reading just one text message can keep the driver's eyes off the road for 5 seconds. Not to mention the contents of that text, which might occupy a driver's attention for long after they've read the message. Going at 55 mph, that translates to about the length of a football field.

Words: 203

Cross Cutting

Causes of distraction

Distraction in general occurs when attention shifts away from a desired area of focus, thereby blocking or diminishing the reception of desired information. Distraction is caused by: the lack of ability to pay attention, lack of interest in the object of attention, or the great intensity, novelty or attractiveness of something other than the object of attention. The consequences of distraction can range from mildly frustrating to deadly. For example, distractions during class reduce learning by reducing the information that is processed, while distracted driving attributes to roughly 15% of traffic-related deaths.

Distraction can be caused by both internal and external sources. Sources that come from the human itself are for example hunger, fatigue, illness, worrying, stress and daydreaming. Additionally, the intake of certain medicines and drugs are also known to influence a person's ability to focus and pay attention to the task at hand. External sources of distraction are social interactions, music, text messages, and phone calls. These have the potential to be distracting because they all compete for the human's attention during a task. More abstractly speaking, any auditory, visual or olfactory trigger can be distracting as well, as it directs the mind away from the task to some other phenomena.

Words: 203

Hearing and vision

To participate in traffic, people rely on a multitude of human capabilities such as reaction time, hearing, and vision. The average driver reaction time is around 2.5 seconds, and the National Safety Council (NSC) recommends 3 seconds minimum spacing between vehicles traveling in the same lane. Hearing requires sound waves to travel through the ear structure until they reach the inner ear, where the thousands of tiny hair cells transform the vibrations into neural impulses for the brain to translate into sound. These hair cells are very sensitive and can be permanently damaged after even a single exposure to extremely loud noise. In fact, most individuals who experience hearing loss are under the age of 65.

Roughly speaking, the eyes work through motion detecting rods and color detecting cones. Around the world, about 39 million people are blind and roughly 6 times that many have some kind of vision impairment such as color blindness. The average blink lasts about 1/10th of a second and people blink on average about 12 times each minute. In addition to this momentary blindness, both eyes have a small blind spot where the optic nerve connects the eye to the brain. This blind spot goes undetected because both eyes work together to fill in each other's blind spots.

Words: 213

Concrete

Frequency and time of accidents

Although accidents and traffic crashes not uncommon, they occur more often than people might imagine. Specifically, on average there is one car crash every 15 minutes, leading to 49 people injured every day, and one person killed every 40 hours. Of these crashes 1% involved a pedestrian for a total of 372 crashes. These crashes have resulted in 380 injuries and 11 deaths. Many different conditions can have an impact on driving, three of the most prominent ones shown in the accident-report are weather conditions, location, and time of day.

Of these accidents, 81% of total crashes occurred during dry weather conditions, 10% during wet, 7% during snow or ice, and 2% during other conditions. The locations of these crashes were reported with 63% in local areas, 30% in other state systems, and 7% on the interstate. The most crashes occur in the afternoon between 3pm and 6pm (25%), followed by between noon and 3pm (17%). The following times are roughly equal in number of crashes: 6am and 9am (15%), 6pm and 9pm (14%), 9am and noon (13%). The least amount of crashes occurs during 9pm and midnight (8%), midnight and 3am (5%) and 3am and 6am (3%).

Words: 198

Wearable technology and smartphone functionality

Mobile phones have a considerable set of capabilities, services and applications that they can offer to their users. Input mechanism are typically through touchscreen, keypad and voice. In addition to calling and texting functionality, mobile phones also support GPS navigation, music and video playback, radio receiver, ringtones and vibration, alarms, memo recording, personal digital assistant functions, video calling, built-in cameras with flash, WiFi connectivity and Bluetooth. Smartphones often come with pre-installed applications like a clock, alarm, calendar, contacts, and calculator and a few games.

Wearable technology are smart electronic devices with micro-controllers that can be incorporated into clothing or worn on the body as implants or accessories. They enable objects to exchange data through the internet with a manufacturer, operator, and/or other connected devices, without requiring human intervention. The most well-known ones are activity trackers, but wearables are continuously expanding into new fields and applications including smart jewelry, head-mounted optical displays, earbuds and smart clothing. Functionality wise, wearable technologies tap into the connected self through battery powered smart sensors (motion, heartrate, breathing etc.), WiFi and Bluetooth connectivity.

Words: 177

Abstract

Non-driver related causes to car accidents

Even with today's technology and a greater emphasis on automobile safety, car accidents continue to occur. The causes of car accidents are pretty varied, but they can be grouped into two broad categories: driver error, and everything else. Driver error is most often the result of "distracted driving", possibly due to the "Myth of Multitasking". Because the human brain is physiologically incapable of performing two important tasks as the same time, the brain selects to process only a part of the information. Thus, people operate under the assumption that they are adequately dealing with both tasks, when in fact they are not effectively accomplishing either task.

There are also a number of non-driver related causes of car accidents. The mechanical performance of the car can play a role in the cause of accidents by impeding the driver's ability to steer clear of any hazard they encounter on the roadway, but also through the car's ability to properly react to the driver. The physical condition of the roadway can also play a significant role in causing a car accident. If a road is improperly maintained, that may make it difficult to maintain traction or to stop in time for a hazard. The same holds true for weather conditions. Moisture can reduce visibility and make a roadway slippery.

Words: 216

Behavioral change programs

There are many theories and models that aim to understand, explain and predict human behavior. While these can be found across disciplines and domains, some fields are more concerned with this than others. In addition to describing what human behavior is and how it works, there are numerous efforts that aim to influence or change behavior. These can be targeted towards individuals and specific behaviors (e.g. smoking and cell phone use), but also towards behavior in general (e.g. eating healthy and thinking positively) or behavior of groups (e.g. team productivity).

While there is a proliferation of theories in sociology, psychology, policy and management, there are only a few that are well-known, and even less that are being widely used. These theories are typically implemented into programs which are aimed at individual people or groups. This can be very valuable due to the high personalization and customization of the program. On the other hand, this sole focus on modifying individuals' behaviors (e.g., teaching patient low-fat food cooking methods) can also be limiting. Therefore, a more productive strategy would be to also include environmental change, for example expanding the availability and affordability of more nutritious food choices. When this is done along with individual skill training, longer-lasting and meaningful changes can be achieved.

Words: 211

Effectual

Available university departments

With around 52,000 students enrolled across all five campuses, the University of Nebraska system is the largest higher education system in Nebraska. Because many students at the University of Nebraska at Omaha (UNO) are commuters, the university has offered assistance through time and resources from their staff and faculty. Additionally, a number of students have expressed interest in this problem and would be available if their help is needed. At the same time, the faculty, staff and students have not been excused from their regular activities, so this would be done in their own time.

The colleges offering aid to help find a solution to this problem are the colleges of Arts and Sciences, Communication, Fine Arts and Media, Business Administration, Information Science and Technology, Public Affairs and Community Service and Engineering. From these, individuals can offer their expertise, aid, and resources in fields such as political science, neuroscience, psychology, sociology, journalism and media, computer science, civil and industrial engineering. Some of these resources include access to software development, robotics equipment, the campus magazine, the campus radio station, 3D printers, information about campus policies, information about road and pathway construction.

Words: 190

Available company resources

This design challenge has attracted the attention of one of your bosses. She understands the value and importance of project's success on the company and has told you that she will provide you with whatever assistance you might need. With her support, you have access to more resources than you would normally have with your usually project team. Although the other bosses have not come forward to explicitly, you know that they will not oppose your requests if they are reasonable, supported by solid arguments and clearly add value.

As a well-rounded middle-sized company, you have access to all the usual departments: Human Resources, Research and Development, Marketing and Sales, and Accounting and Finance. The budget was established in conjunction with the product owner, the project manager and someone from finance. Although you have personally never worked with them before, from what you understand they are not unfamiliar with each other, and so far, the collaboration has been satisfactory. Your budget is realistic enough that you feel confident that you can develop a solution within the provided time frame.

Words: 179

Causal

City requirements

There are certain requirements and expectations for the project that your team must meet for the city of Omaha to sign off on the project. This solution must reduce the rate of accidents by at least 10% across the Greater Omaha area. The solution should be made with all residents and visitors to the city of Omaha in mind and should thus be inclusive of those with disabilities and other accessibility needs. While the solution must be completed within the agreed upon time between your team and the city, the amount of time the solution will take to achieve can be negotiated depending upon the solution.

All aspects of the solution should be accessible and user-friendly for all individuals regardless of background. With this in mind, the solution should be widely used, usable by all people, by many individuals at the same time, to the greatest extent possible, without the need for further adaptation or specialized design later on. The solution should also not interfere with or disrupt any business activities that may be going on during the day or night time, during the working week or in the weekends. It should be safe for all users and should not pose a threat to any individual's physical, mental, or emotional well-being. This includes bodily harm, bullying, theft or distribution of personal and sensitive information, etc.

Words: 225

Dangerous driving

The Department of Transportation for the State of Nebraska (NDOR) issued a notice a few months back informing drivers that there has been a rise in the number of accidents occurring this year within the state. In an attempt to keep this number from growing any larger throughout the rest of the year, this notice included a message that drivers and pedestrians alike should be more mindful of their whereabouts at all times and to especially be more aware of the traffic conditions around them.

NDOR also noted that all individuals should take equal responsibility for their possible contributions to accidents and spread awareness of traffic conditions and the number of accidents to all of those around them. On these lines, NDOR reported that it will be conducting a report of traffic collisions at the end of the year and advertised that there is information on its website. Last year, the top 15 causes of car accidents were; 1. Distracted Driving 2. Speeding 3. Drunk Driving 4. Reckless Driving 5. Rain 6. Running Red Lights 7. Running Stop Signs 8. Teenage Drivers 9. Night Driving 10. Car Design Defects 11. Unsafe Lane Changes 12. Wrong-Way Driving 13. Improper Turns 14. Tailgating 15. Drugs.

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