**UX DESIGN REPORT**

**‘Shocking’**

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| **DATE SUBMITTED:** | **01/04/2020** |

DECLARATION OF ACADEMIC HONESTY: I declare that the content of this assignment is all my own work. It has not been submitted in respect of any other course/module. Where I have used the work of others it is acknowledged and referenced accordingly.

**UX Report – ‘Shocking’**

**Understanding the problem space**

The issue of climate change is a growing problem in the world today and our generation will be responsible for causing change in the world. Thousands of students across the world have demonstrated a willingness to see change in attitudes towards global warming over the past few years through climate change protests and strikes (Aronoff, K, 2019), but many still show naivety and a lack of interest towards the topic. These are the types of people and personas who we looked to target and influence when conceptualizing our product. The goal of this assignment is to help reduce students carbon footprint across the country. We planned on accomplishing this by helping them to generate less energy which will result in each apartment or household emitting fewer greenhouse gases. This will subsequently result in an improved environmental performance from each household. We wish to influence these students by increasing their awareness of the amount of energy they are actually consuming and letting them know how detrimental that is to the climate. We felt that this information alone wasn’t enough and that these statistics and results would mean very little to students if we wanted to change their behaviours. As well as letting the user know how much energy they are consuming, we decided it would be beneficial to let the user know how much money they are actually spending on energy consumption. These thoughts are backed up by a study done in the Waterford Institute of Technology where researchers found that “When given feedback, occupants were dispassionate when presented information in terms of energy units (kWh) but absorbed information straightforwardly once the same information was expressed in monetary terms.” (Barron, J., & Sinnott, D, 2013). This made us feel like we had to implement a way of informing the user of their usage in monetary terms into the product. This study also found that the energy consuming appliances aren’t actually the problem when it comes to energy consumption, but it’s the people who are using the appliances that are the problem. For example, energy usage by people in older less efficient dwellings with older occupants was found to be substantially less than energy usage of younger people in supposed more energy efficient homes (Barron, J., & Sinnott, D, 2013). This proves that the appliances are not the problem but the behaviours of the people using the appliances are the problems.

**Conceptual Design**

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Description automatically generatedThe product that we have developed is a mobile app that enables its users to monitor how much energy they are consuming and how much money is being spent on their electrical and household appliances. The goal of the app is to increase the users awareness of their energy consumption as we felt that that is the first step to reducing peoples energy consumption and subsequently reducing their carbon foot. A study done in the University of Kent proved this to be true as they found that “the combination of a real time feedback system with a human energy delegate in 8 halls resulted in higher reduction of 37% in energy consumptions when compared to the baseline amounting to savings of 1360.49 kWh, and 713.71 kg of CO2 in the experimental halls.” (Emeakaroha, A., Ang, C. S., Yan, Y., & Hopthrow, T, 2014). This study was done to find if a real time feedback system (raising peoples energy awareness) resulted in a reduction in energy consumption. The results, when partnered with a human energy delegate, proved to show high reductions in energy consumption. These conclusions were exactly what we had in mind when conceptualizing a product. In order to do this we felt like we needed to inform the consumer on how much energy they are using and how much money they are spending by means of a graph. I felt as though the Apple screen time usage page helped me to reduce my amount of time that I spent on my phone as it made me aware of how much time I spent on each app every day and every week. It also let me know my average amount of time spent on my phone per day, so I would find myself trying to use my phone less than my average daily amount. This reduced my mobile phone usage so I felt that it could also be used to help to reduce energy consumption of our users. We then decided to model a page of our app around the Apple screen time page. This allows the user to know which household and electrical appliances use up the most energy and which cost the most money to use. We also wanted the app to feel simple and navigable to use as we felt that complicated apps make the user more reluctant to use them. We also wanted to give it a catchy name and a play on words so we decided to call the app ‘Shocking.’

**User requirements**

Making sure that the app was simple, smooth and efficient to operate for the user was one of our top priorities when designing the app. We tried to accommodate for the user as much as we could when conceptualizing the design. The first step we took to make sure the user could enjoy the use of the app was to make sure that we outlined everything very clearly for the user. The home screen is very navigable for the user as there isn’t an overload of information and it is very clear to see how it’s used. On our statistics page we made sure to label the bar chart graphs in order to accommodate for colour blind users, they otherwise would not have been able to make sense of the graphs as it would be dependent on the user looking at the keys beneath the graph to understand what colours represent each appliance. Another user requirement that we took into consideration was the ability for the user to swipe to use the average amount of watts when deciding how much energy they wish to consume when using an appliance. This function can be used when the user is unsure of how much energy to use and can also be used if the user is not in the mood to go through the process of deciding how many watts they wish to use. It is an easy option for the user in these circumstances while also enabling them to remain energy efficient in the process. This option is also available if they want to decide the duration of their session. They can just tap on the custom clock if they are unsure on how long they wish to use the appliance for.

**Low tech prototyping**

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Description automatically generatedThe home screen contains a statistics icon on the upper right corner of the screen. Tapping on this icon will bring the user to the statistics page. The statistics page displays a lightning bolt, which (if tapped on) will display the energy consumed graph, and a euro sign, which will display the money spent graph. These graphs will tell you, respectively, what appliances have used the most energy so far and what appliances have cost you the most so far. The graphs are displayed by a bar chart. The home screen also contains a profile picture in the top left corner of the screen. If you tap on this profile picture it will take you to the ‘My Appliances’ page. The user can choose what appliances from this list that they wish to use and display on their profile. The home screen will now contain a list of chosen electrical and household appliances. Each appliance can be tapped on in order to display the screen of that appliance. On this screen the app will display a page that will ask the user how many watts they want to consume for their usage of the appliance. The user can either manually input the amount of watts that they want to use or they can select to use the average amount of watts that the appliance typically needs per session. Alternatively the user can choose how long they want to use the appliance for by manually inputting the time they want to use the appliance or otherwise they can click on the custom clock which will set a custom duration time previously chosen by the user. This will allow the user to spend that custom amount of time to use the appliance. Once the user has completed their session by either using the amount of watts they entered or by spending the amount of time they wanted to spend, a summary screen will be displayed which summarises the users session. This summary screen displays how much energy the user just consumed and how much money it cost the user to use that appliance. After the summary page has been displayed the user will see the ‘Alternatives Page.’ This page shows the user alternative options for the equivalent amount of watts used just to let them know how much electricity they are actually using when going about their everyday behaviours.

Figure Summary Page

Figure . Home Page

**Evaluation**

When evaluating a prototype you have to answer the question ‘what’s good about this product?’ and you also ask yourself what problems do we have with this product. There are any benefits with the prototype ‘Shocking.’ One of the big advantages of this app is its simplicity. The app is self-explanatory to operate and there is nothing about the app that would discourage people from using ‘Shocking’. In order to achieve the easy accessibility we used a set of simple lists, clear instructions, labelled graphs and meters and also well-defined summary pages. Unclear and vague apps will discourage the user to use the app so simplicity is an essential feature of the app for user experience. Another advantage of this app is that it increases the users awareness of their energy usage. This is one of the biggest assets of ‘Shocking’ as the first step for reducing energy consumption is raising the users awareness of their own consumption. If they don’t know how much they’re using then they will be unlikely to cause change. If they know how much energy they are consuming and how much money they are spending then they will be much more likely to change their behaviours and consume less energy and subsequently spending less money. Another advantage of the app is that it promotes financial savings for the user. The user is constantly being reminded of the amount of money that they are spending and they can set targets and reminders in order to keep their money expenditure down. The last benefit of the app is that it encourages the user to reduce their carbon footprint. It encourages the user to keep the amount of time that they are using their appliances down and therefore reducing their carbon footprint. This means that households will emit fewer greenhouse gases which improves the environmental performance of each household. Measures we took to encourage the user to consume less energy were that we informed the user how much they were using, we let them set a target for the amount of energy they want to use as well as set a target for the amount of time they want to use something for. We also let the user know alternative options for the equivalent amount of watts used just to let them know how much electricity they are actually using when going about their everyday behaviours.

When evaluating software prototypes you also need to be as critical as possible of the design in order to be able to make the product as satisfactory as it can be for the user after its redesign. We understand that the main problem with this app is that there is such a high dependency on input from the user. We understand that it may feel inconvenient for the user to have to input their usage time and watts every time they use an appliance and we are aware that if the user decided to be lazy and not bother to input their daily usages then the app would be entirely ineffective. This is a problem that we couldn’t address during the low-tech prototyping stage as we don’t have the resources to solve a problem this complex but we are certainly aware of the problem and have drawn up possible solutions for the products redesign. Another problem that we encountered during the design of this product is that it only tracks the personal energy usage of the user and it doesn’t monitor housemates or family members who also use the same electrical and household appliances. This was difficult to include in the original prototype but we are aware of how to solve this problem.

**Reflection and Redesign**

The first improvement we have drawn up during the redesign process was to connect the app to the household appliances. This removes the high level of dependency from the user as it would allow the app to automatically monitor the amount of energy that has been consumed by each appliance. This will hopefully make the user more eager to use the app as it is less monotonous for the user. The app would also be automatically notified when an appliance is turned on and off again. This would allow the user to get all of the statistics and summaries without having to input anything which subsequently makes the user more inclined to use the app. The user would be more inclined to use the app because this new redesign takes away the lethargic process of pressing start and stop every time they use an appliance. Another benefit of this is that all statistics will be automatically calculated without any input needed from the user. Another problem that this redesign solves is that it enables the app to be compatible with all electrical appliances, including ones that are only used for a brief period of time where the user wouldn’t normally input usage times for.

Another improvement we have made in our redesign is the option to sync apps between family members or housemates. This change would allow all members of the household to sync up their apps in order to receive more accurate overall results both for energy consumption and financial reasons. This would eliminate the problem of the app only tracking personal usage and instead would track the entire households usage on all appliances which allows for a more accurate and rounded set of results. House members could also compare their own personal consumption results with the results of their family members. This change could allow for healthy competition within houses as it allows family members to compete over the least energy consumed.

**All prototype pictures**

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Aronoff, K. (2019). How Greta Thunberg’s Lone Strike Against Climate Change Became a Global Movement. *Rolling Stone. https://www. rollingstone. com/politics/politics-features/greta-thunberg-fridays-for-future-climate-change-800675*.

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