SOEN 490 – Team 6: Graduate Attributes

1 Impact of engineering on society

1.1 What impact, if any, does your product have on the wellbeing of people?

This software has been designed and developed for the "Service de Premiers Secours" (SPS) of the Canadian Red-Cross, Quebec division. The task of the SPS team is to provide citizens with free first-aid treatment during public events. Our software will render the service more efficient and will help reduce the response time of first-aid teams during life-threatening situations. Also the statistics produced can help the service better themselves by identifying the aspects of interventions in which they are lacking. In other words, our software might make the difference between life and death for a many patients that are in critical need of rescuing and as such, our software has a huge impact on the wellbeing of people and society.

1.2 What are the potential negative effect(s) people may experience as a result of your product?

We cannot find negative effect that people may experience as a direct result of using our product other than the unhealthy effect of the extended use of a digital screen. However in the long-run, we imagine that the regular use of our software will cause dispatchers to become accustomed to it. On one hand, this will increase their productivity and efficiency, but on the other hand it might cause them to lose the habit of using pen-and-paper forms and in the off chance that a situation occurs in which they are not able to use our software for whichever reason, they won't be able to run the operation as good as they currently do with the paper forms.

1.3 Can your product impact the environment?

Our software does impact the environment by the simple fact that the service currently uses pen-and-paper forms. Our software will reduce the paper and ink consumption of the service significantly. Additionally, the filled forms have to be kept for 7 years after the operation, that uses a lot of storage space that can be used otherwise. Also, it is worth noting that it is understood that the software is required to run on a computer, and as a result its impact can be associated with the impact of those computers on the environment.

1.4 What kinds of measures have you taken in order to minimize the impact of your product on the environment?

Our product, a software, only consumes power so its impact on the environment is minimal and even negligible. However we did make it as efficient and as light-weight as possible so that it consumes less processing power and does not need a powerful computer to run on, thus reducing the waste of computer components and increasing the reuse of old computers that would be able to run the program.

2 ETHICS AND EQUITY

2.1 WHAT ETHICAL IMPLICATIONS, IF ANY, HAVE APPEARED AS A RESULT OF YOUR PRODUCT?

Our software will be used as a major contributor in a service that helps save lives, which can be considered an ethical implication. We kept that implication in mind throughout our development process and it motivated us to find new ways of doing the same task but in a more efficient way to save time and reduce the cognitive load for the dispatcher that is using our software, thus rendering him more effective at his task.

2.2 WHAT KINDS OF SOLUTIONS YOUR TEAM HAS ADAPTED IN ORDER TO ELIMINATE THE ETHICAL ISSUE(S) CONCERNING THE PRODUCT?

We can't find any ethical issues concerning our product as it has a negligible environmental footprint, a positive ethical implication with regards to its impact on human lives, and the fact that we plan to donate it.

3 PROFESSIONALISM

3.1 DO YOU UNDERSTAND THE IMPLICATIONS OF YOUR DECISION AS AN ENGINEER DURING YOUR CAPSTONE PROJECT?

As engineers, we try to evaluate all the aspects of our decisions including their impact on society and the environment. All efforts are taken to reduce the negative effects and a careful analysis of the pros and cons guide our decisions.

3.1.1 To what extent do you believe your project will have impact on society?

Although the social impact is local to Montreal and its surroundings, the SPS service covers public events that attract in average more than one hundred thousand people each year, and that they assist or rescue around one thousand patients every year. As mentioned above, our software will assist in the coverage of those people, and so it will enhance the service provided at those events. So yes, the extent of its impact on society was understood before the start of the project.

3.1.2 To what extent do you believe your project will have impact on the environment?

The extent of the programs impact on the environment was also understood before the start of the project, and although it was taken into consideration, the impact did not weight a lot in our decision-making process since it can be considered as negligible due to the fact that computers are widely available and processes have already been implemented for them to have the least impact possible on the environment. It has less impact on the environment than the current paper based system.

3.2 HAVE THERE BEEN ANY CONTROVERSIAL ISSUES? HOW HAVE YOU RESOLVED THEM?

We did not face any controversial issues in the scope of this project, we just had matters that needed to be addressed (described below).

3.2.1 What are the legal implications?

There were not controversial issues, however we did have a small legal matter that needed to be resolved before the start of this project. The current paper forms that are being used have been approved by the Red Cross's legal department which deemed them admissible in a court of law shall any of the volunteers of the SPS service or the service itself be sued. Instead of going through the approval process of the Red Cross's legal department, it was agreed that the software can be approved under the same conditions if it is able to produce documentation that minimally contains all the information that the current paper forms have. Also, we had to request legal ownership rights of the software so that it can be transferred to the Red Cross at the end of the project.

3.2.2 What are the social implications?

We did not face issues that had social implications.

3.3 SCHOOL/COURSE RULES AND GUIDELINES:

3.3.1 Timely delivery of tasks?

The project was divided into 4 releases and 12 iterations adequately. However, we believe that feedback could have been provided quicker which would have allowed us to react appropriately and improve the quality of our software at a faster pace.

3.3.2 Obtaining necessary permissions to conduct experiments?

No special permissions were required to test our project since it could be executed on our own personal computers as well as university provided lab computers.

3.3.3 Your relationship with the technical personnel who are assisting with Capstone courses

Although the personnel was available, we did not need to contact them for assistance.

4 ECONOMICS

4.1 CAN YOU MAKE MONEY FROM YOUR DESIGN?

The functionality of our software would make it ideal for anyone who wants to run a private first responder's unit to cover events around the city. As such it would be very possible to make money selling it to people like that. However this software was developed for the Red Cross first responder volunteers and as such no money will be made off it.

4.2 DO YOU PLAN TO MAKE MONEY FROM YOUR DESIGN IF AN OPPORTUNITY ARISES?

Even if our deal with the Red Cross were to fall through for whatever reason, there is currently no plan to make money off the software; however we do technically own the rights and thus it could be a possibility.

4.3 For software projects: Would you be interested in releasing your product to the public domain under an open source license?

If the Red Cross does not require exclusive rights, we would be very interested in releasing this as an open source application. The bottom line is this is a program that was designed with medical first responder's in mind and, as mentioned in the ethics section, this could end up saving lives. So the more people use it, the greater the social impact of the project.

4.4 Can you manufacture?

Our capstone project is software and as such this question is not applicable. It can be accessed online as such there is no need for a physical medium of transmission (e.g. CD or USB).

4.5 What do you need to manufacture?

See above, nothing is required since there is no manufacturing.

4.6 Would you change your design to improve the marketability of your product?

Since our project was designed to fit the specific needs of a particular service (which is our primary market and stakeholder), there is no plans to change the design to improve marketability. In the case that this was published as an open source project, the people who would choose to download it would have the right to change it however they saw fit. It is worth noting that we will provide our contact information inside a "README" file in our software folder so that anyone that needs information or assistance in modifying the software can ask us directly.

5 Lifelong learning

5.1 What additional knowledge have you self-acquired in order to tackle your capstone project?

When we first started the Capstone project, only one member had any knowledge of how to program for Android and that was a passing familiarity at best. As such through the course of the project the people on the Android team learned the proper methods for Android programming and how to integrate it to other software.

Other self-acquired knowledge was the differences between the various types of Databases. This was important in order to select the optimal database for us.

When it comes to the actual program, we had to learn a lot about WPF in order to be able to produce a program that looked, felt and had the functionality of a student in his final year of engineering.

5.2 What research methods have you learned in order to acquire necessary knowledge/information needed to tackle your capstone project?

Multiple research methods were used for our project because a lot of the more specific elements (Android programming, what sort of database to use, etc.) were not known to our team at the start.

First of all, because c# is a very well documented language, we used a lot of the official resources on Microsoft's website. It was very nice to have their pages which detailed everything from which resources to include to a simple example of working code. Other working examples were observed on websites such as 'StackOverflow' in order to glean the answers to certain impasses. A second good resource that we never expected to use but in fact came in very handy (especially with regards to code smells, refactoring and proper programming patterns) were our textbooks from our various SOEN classes. Finally, we used the personnel resources available to us through Concordia University.