After Action Review
NG911

Team Bugs: Abdelrahman Rabaa, Li Pan, Renz Rivero

University of Regina

SSE Capstone (ENSE 400/477)

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Expectations
What was expected to happen?

Purpose and Objectives
What was the purpose and objectives?

The purpose of the project is to bring about the same multimedia connection popularized by most social applications of today into an emergency application. It is about time and according to a former RCMP (Royal Canadian Mounted Police) officer, John Leitch, it is estimated that such features will be coming to Canada around the year of 2024. Given this information, the ultimate opportunity that the project will provide is inspiration for this upcoming infrastructure being called the NG911 (Next Generation 911). Besides that, the innovation that can prove relevant from the project until then will come in the form of having documented information of emergencies reported using the application for support workers to use.

Stakeholders & Project Allies
Who was the audience? Who was involved?

Ideally, the project should target a global audience. However, this scope is narrowed down to the province of Saskatchewan in Canada with the guidance of; previously mentioned former officer John Leitch; Dr. Yasser Morgan, our faculty mentor; and Tim Maciag, our capstone instructor. With our valuable resources having direct experience of the workings of the 911 system in the province, this decision makes most sense. And directly responsible for the success of the project are the three team members Abdelrahman Rabaa, Li Pan, and Renz Rivero.

Planned Timeline
What was the initial timeline?

With the thought of needing to learn new Google-backed tools such as Flutter and Firebase whilst developing the project, the plan is to use the first half of the capstone course for

getting comfortable with the required Dart language to program. So the team will inevitably waste time implementing design visuals just to refabricate them given every feedback and obstacles that are met on the technical aspect, but it will enhance each member's capabilities in working with the Flutter environment. This planning phase is to be backed by storyboarding to ensure that the failed attempts to fill the unknown gaps in the pages is not just to fail fast but is also for finding the best native packages provided by the Flutter environment to implement and work the design around on.

For the second half of the capstone course, the hope will be to have prepared and be comfortable enough with the programming language and the new environment in general. This phase is dedicated to having the interface actually be able to execute desired functions rather than just being able to switch tabs on the application. Easier said than done but once all desired functionalities are working, the focus moves to polish and optimizations of the features accomplished.

Planned Vision
What outcomes and outputs were intended? What products were to be produced?

At the onset of the project idea, privacy and security concerns have been prominent so whatever is to be produced must have some sort of solution. The envisioned product outcome is a mobile application capable of the proposed multimedia connection of SMS, audio call, and video call between a person in an emergency and an emergency dispatcher. To further efficiency in an exchange, this application will have a profile page for users to input relevant information, such as their medical information, that they can choose to automatically share or not the moment they establish a connection with a dispatcher. Not ambitious enough, this exchange is to be documented for users to access at any time for reasons such as providing support workers more information about an emergency scenario.

Results
What actually occurred?

Purpose and Objectives
Evolution of the purpose and objectives

After completing the project, it is clear that the product evolved for the better but the purpose and objectives remained the same. The produced software system can definitely be of inspiration, both good and bad, for the upcoming NG911 infrastructure. Moreover, an efficient solution for providing support workers as much information as needed about an emergency situation is satisfied and comes in the form of records that are accessible for emergency users to disclose if they want.

Stakeholders and Project Allies
Evolution/expansion of the stakeholders and project allies

Same as above, the target audience and mentors relatively remained the same. In terms of the previously mentioned project advisers and their contribution in the development process, they really fine-tuned the original planned vision for the product. Without their guidance, the second product produced for providing a dashboard for emergency dispatchers would not have been part of the development process. More on this under the overall result label but the proposal for a second application along with the mobile application solved several gray areas that would ultimately cause the original plan to fail. This became evident when the team received valuable advice and feedback during a meeting with a current emergency dispatcher Lori Kolybaba.

Actual Timeline
How the project actually played out

The team mostly followed the original timeline of dividing the development process to have the first half of the course mainly focusing on front-end development and the second half for back-end development. With the proposal to include an emergency dispatcher dashboard to

the development process, a much more weighing for back-end development became required as compared to the original plan of getting comfortable with the tools via the ease of entry that front-end development provides. So, back-end development happened approximately two months earlier than planned as connecting two different applications proved to be more difficult than just connecting two of the same application. Otherwise, there would not have been an MVP to show for at the end of the half with the inclusion of the dashboard.

Starting off the second half of the course, multimedia connection amongst many other features such as location tracking and profile updating have been achieved. Although unstable and needing a lot more work, the team continued success by preventing any more ambitious features to creep in. Most of the second half became dedicated to making not just a better looking system but also a stable and optimized build of the proposed MVP in the first half. Lastly, the remainder of the term included documentation updates, poster creation, commercial filming and editing, as well as testing in preparation for project day.

Overall Result
Products produced

Overall, the products produced turned out significantly larger than intended. There are two applications: a mobile application for making a connection with an emergency dispatcher, and a dashboard for emergency dispatchers to allow connection with a requesting mobile user. The connection between the two applications allow for multimedia functionalities such as text, audio, and video. Moreover, automation of sending over information that could prove useful to an emergency dispatcher such as current location, phone battery, phone number, medical history, and more is implemented. While the less sensitive information requires little to no setup, the more sensitive or private information such as location, medical documents, and emergency contacts requires setting up in the profile page of the mobile application. Important to note, this

setup involves allowing mobile users to opt out of sharing any sensitive or private information. On the other hand, choosing to allow such information to be accessible by an emergency dispatcher during an emergency scenario requires users to upload deemed relevant documents in the profile page and or give permission for the application to use certain hardware in their smartphones. Ensuring true privacy, encryption methods can be implemented to all information saved into the database to make it non-human readable. The project compromises by encrypting only the SMS interaction between the two applications for better loading times and a much presentable product. It is not to be compromised in applications outside the scope of a capstone project. Lastly, all exchanges made in a connection are documented and accessible to both the user who reported the emergency as well as the emergency dispatcher responsible for the person under emergency. This satisfies the objective of providing support workers more information about an emergency scenario when and if needed.

Methods
What went well and why?

Ease Entry to a new Tool With Front-end Development
Main focus on front-end development to ease Flutter learning

For the first two months that allowed this to happen, it has proved well in terms of making the team comfortable with the new software tool environment. It prevented overthinking of picking out the best tools to be used and eased commitment.

Weekly Meeting With Our Allies
Accountability and guidance on what the next steps should be

The weekly meetings with Dr. Morgan and former officer John Letich helped with providing accountability to each member of the team. It also provided an outside professional perspective on the team's project visions and guidance to a clear solution that will work best for the project purpose.

Decision to Build a 911 Dispatcher Dashboard
Enlarging project scope for the better

This decision came about in one of the weekly meetings and speaks volumes in the importance of having the meetings. Out of fear of enlarging the project scope, the team would have been in a worse predicament. It would be much more work implementing just a mobile application that somehow specifies available features depending on whether the user is an emergency dispatcher or not. The result would have been a much more complex login system and it was not even of concern or in the awareness of the team at all. Even if it could have worked, it will not have the same inspirational impact that the actual product produced can provide. This is true because it is likely that the upcoming NG911 infrastructure will take advantage of much more powerful machines and provide their dispatchers a dashboard in front of a bigger screen as it is on the existing 911 system.

Knowing the Middle Ground Between Standing Ground and Flexibility
Taking feedback and being pulled from different directions

In the early stages of the development, the team felt vulnerable in being pulled in all sorts of directions in terms of where and how the project should go. If not for flexibility in the details of how the purpose is to be achieved, the dispatcher dashboard would not have happened. The opposite goes with the idea of going through with using Google backed software. If not for standing ground, resources could have been wasted abandoning progress just to reboot it using different tools.

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Reflections
What can be improved and how?

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What Could We Have Done Better?

With clear holes in the original plan, the team could have spent more time on building a good understanding of how to go about achieving the main purpose of inspiring the upcoming

NG911 infrastructure. Not to say build a perfect plan before developing, but more time to fine-tune the idea and somewhat fill out the gray areas would have been better. Also, progress has increased when certain roles were assigned to each team member: Abdelrahman Rabaa as back-end lead, Li Pan as all in one scrum master, and Renz Rivero as front-end lead.

What Would We Do Differently In Similar Situations In The Future To Ensure Success?

For future projects, more time will be dedicated to defining the purpose of the project in order to clearly list objectives and the best tools to get the job done. Also, the team would strive to get feedback as quickly as possible and assign designated roles to each member for optimum progress.

Advice To Future Project Teams

1. Take the time to communicate with stakeholders and ensure that they envision the project idea the way the team envisions it. This way, gaps in the seemingly perfect idea from the group can be spotted early in the development process.

2. Ensure everyone is on the same page with regards to the project by having weekly meetings. These meetings do not have to be long and best to be straight to the point.

3. Document as soon as an opportunity to fill out one of Tim's given templates comes around. This will save valuable time nearing the end of the capstone course for ensuring a better quality product than having to catch up on documentation.

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Closing Remarks
Key points summary

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Project Definition and Communication

Define the project vision thoroughly that makes it possible for everybody else to clearly picture the idea when it is communicated to them. Without having to develop anything yet, this already allows for feedback which the team could use in redefining the vision for the better.

Whether it be big or small impact feedback, carefully evaluating these will improve the quality of the product to be produced and will make presentations easier without having to go technical about everything.

Stubborn, yet Flexible

As with most, there is a balance. Be stubborn enough on the project idea to not give up too soon on a solution but also flexible enough to try a different solution when it really is not working. Put trust in the agile method and strive to fail fast by producing a minimum viable product. This will also ensure that the gaps hidden from storyboard and general communication get spotted early in the development process.

Document, Document, Document

The most boring part of any project but is the most important. It gives context about the decisions made and the big picture starts to align as more documentation is written. Whether it is the time and day for a meeting or a feature creep, write it down. It allows the mind to relax and put energy on other aspects important to the project.