Landscape

This product will be competing in an emerging market. Chatbots and Monitoring software is out there, however, I’ve been unable to find a piece of technology that does both. Our product will incorporate a lot of the features of both options on the market along with adding some more recent advancements to create a better platform. An example of a piece of software that monitors a kid is uKnowKids (UKnowKids 2019) it can store that information and have a parent read it back or if necessary, alert the parent when suspicious things occur. BetterHelp (BetterHelp, 2019*)* is an example of a therapy chatbot, however, neither software combines both options.

Aim

The aim of this product is to provide parents with a tool to assist them with their child’s mental health. With a wide divide of computer literacy among parents, it’s important to provide an easy to use platform that would allow parents to install, set up and walk away. There are 4 major goals of this project; create a monitoring software that captures all usage, create a mental health database, create a chatbot that can tailor its interactions and reduce the impact of mental health problems in kids.

Having all the data captured from everything a child does is paramount to getting this right. If a child is being bullied inside a game or on Facebook, we need to capture the data for better analysis. If we don’t have the correct data, the product won’t be as effective as it could be.

A mental health database is vital to what we’re doing is we are relying on this to cross-reference each child’s information. If this isn’t established the product won’t work. By having a vernacular of mental health we’ll have a much easier time highlight adverse behaviours.

A chatbot that is highly tailored is important. If we can’t get it to speak “kid”, we’ll struggle to have them feel comfortable interacting with it. The chatbot also needs to address when it’s time to escalate to some sort of outside help.

The whole point of this is to give children and their parents some help navigating what is fast becoming a huge societal problem. Not identifying these kids fast enough is creating developmental issues socially and in education. (Cook, 2019)

If we were unable to achieve all of this, the monitoring and database are the most important parts of this. If we could at least provide parents with a report of the adverse behaviour they would be able to follow up on their own. Whilst it would interfere with how we’re trying to indirectly influence the situation; we’d also like to make sure this product would help in some way.

Plans and Progress

Before Open Minds had its name, we were discussing our internet horror stories. They went from concerning to extreme and we eventually got onto the topic of mental health and how parents who weren’t very tech-savvy would struggle to monitor their children without seeming overbearing. A mental health extension for web browsers was a concept we decided could be very beneficial.

From there it was about figuring out the best way to execute a mental health browser extension. We explored how it would work. It would collect the data and upload to a database that would compare it to other users and the test cases. It very quickly became apparent a chrome extension wouldn’t be the only part of this. This expanded to a piece of monitoring software that would also have a chatbot and an escalation process for at-risk behaviours.

At this point, we’re able to create one extension for multiple browsers. This will help us to reach more people with fewer issues (Rousett, 2017). Although Safari is not supported it’s easier to write 2 extensions instead of one for every browser.

Microsoft Custom Vision Service will be integrated into this as well. It is used to analyse pictures and determine what they are with a high degree of accuracy. As pictures often have unrelated names to what they’re looking at it’s important we use all the tools available.

We thought before we get too carried away, we should investigate the full scope of the problem. We quickly found out that it was a bigger problem than we thought. Almost one in seven children were assessed to have a mental disorder in the last 12 months. This equates to 560,000 Australian children and adolescents (Cook,2019).

One of our big concern’s is would the children interact with the bot. Would we be able to convince a child that we weren’t their parent monitoring them and that the bot was their “friend.” After discussing with a mental health specialist, we began to understand that it was possible, but it would be important to make a big effort to make sure all part of this project was executed properly. Failure to do so would derail the rest of the project.

As we are in the development stage currently, we don’t have an IT infrastructure. We need to rent server space and build our initial database of information. All our concepts are currently being hosted locally or with external providers. Microsoft Azure currently holds our chatbot resources and we have a lot of our initial Mental Health research is stored in a GitHub repository.

The Browser Extension is planned as a keylogger that will record the child’s online activity. This would then be uploaded at a frequent interval depending on how the child has been assessed. If the child is deemed to have non-adverse results it would be weekly. For adverse results, the timeframes would get shorter based on a scale of adverse behaviours and duration. As an end game, we would hope to be able to live monitor and contact the appropriate people in an extreme circumstance.

We have a chatbot that works however without the back-end information it’s very basic. The chatbot we’ve chosen to use is the Azure Chatbot. We’re using it to understand how the chatbot works and how customisable it is. The chatbot will require comprehensive testing to make sure children are interacting with it as a tool and not a novelty or chore.

For the algorithm to be feasible it will require a significant amount of test cases to generate an effective, initial algorithm. It will have to be a combination of Machine Learning methods. Initially, a Naïve Bayes may be useful, we would then follow this up by using unsupervised learning and then Reinforcement Learning to highly optimise the algorithms. We want to initially identify the common language, themes and websites they visit at least give us some understanding. Using just Naïve Bayes would present an issue down the track where we may not be able to identify correctly risk factors. Given the way, new words enter our vocabulary and different regions use different slang we’d be reckless to rely on a setlist of words as a Naïve Bayes is designed to.

Once the algorithm can identify cases with adverse results it will then need to be further tested in a live trial. This will be by installation on a group of children’s computers. These test cases will be manually checked by our professionals and compared against what the algorithm concludes. After the initial test, we’d require a second bigger test in another market i.e. USA or the UK. Just to make sure the algorithm isn’t constrained by dialect or colloquialisms.

The database will be an important part of this. Because we’ll be comparing User’s data to the database, we’ll need to make sure we’re able to accurately retrieve data where words may have multiple uses. For example, the colloquialism “That’s Sick!” By itself, it could be positive or negative. We’d need a frame of reference for the commenting meaning we’d need the algorithm to be able to quickly access the database and figure out whether it’s a good or bad term. Keeping this in mind, we’d be looking to develop with NoSQL.

NoSQL will afford adaptability for this concept as we generate better information, we can easily change database structures to create a more optimised experience. The other huge benefits especially since we’re dealing with sensitive information this database style is highly secure and easily scaled. As soon as we got a working infrastructure, we could easily scale to meet the demands of our client base. (MongoDB, 2019)

We will need to consult the appropriate legal representatives. We want to make sure we’re not going down a path that could get us in hot water. This would mean consulting around child safety, how we must store certain data and making sure we craft an End-User Licence Agreement that prevents us from any litigation that may arise from heavy reliance or misuse by an end-user.

Future Plans

When the application is ready for market, we’ll need to create a series of tutorials. They’ll have to be text-based and videos detailing how a parent should use the software effectively and react to alerts. The main idea being parents understanding their role within the situation to avoid unnecessary stress being placed on the child.

It would be beneficial from early on to partner with a mental health organisation. Not only to lean on their resources around mental health, but it would also give us a credible and trustworthy endorsement. It may open doors for us we couldn’t previously. The better the help we have the faster we get to market.

As a potential partnership much further down the track it may also benefit us to partner with a virus protection company. If we could combine resources with one of these companies, we may be able to improve firewalls, safe modes for parents or even potentially piggyback on their hardware to make it more beneficial and less invasive for the end-user.

A big part of the potential going forward is the ability to analyse a child’s voice. We see the potential for adding a voice function for our bot. This would allow us to engage the child in a way they find more comfortable and less effort than typing. There is also some excellent work in Machine Learning being able to determine your mood based on your tone (Balakrishman, Anusha). This is in its infancy and would be something considered much further down the track.

Music is a powerful mood enhancer. People who are depressed often gravitate towards sad music to reinforce their negative thoughts. We would add playlist monitoring as another extension to the application. Whilst everyone will occasionally listen to sad music, someone who is constantly listening too it should be monitored (Andrei, 2019)

A cornerstone of this endeavour is providing parents with better information. Once the business has proof of concept we would like to partner with schools and any other children’s mental health organisation to set up meetings with parents. This would be a seminar around utilising our software better, things our application might miss and an up and coming section surrounding the technologies we have in the pipeline.

Overall this will be a complex and lengthy process to get it to market. We will probably come across some dead ends due to how big our idea is. We will certainly have to pay attention to emerging processes and ideas in our space to make sure we provide the best product we can. If we can make everything here work, we should be right in line with what we’ve aimed to achieve.

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