Women's Economic Empowerment Conference: TechSprint Demos
Thursday 25th March 2021

Finding Nora

Presenter: Elissa Webb
Judges: Nick Cook, Sophie Bantanidis, Faith Reynolds and Jane Portas

Elissa
Hi everyone, my name is Elissa and I'm part of team Finding Nora where we want to use machine learning to identify financially disempowered women in relationships. For the past three days I've had a great time working with Georgia, Abby, Nira, Catherine, Parul and Justus and our mascot Nora Neuron represents the artificial intelligence that we've used on this project.

Economic abuse is a form of intimate partner violence and it involves behaviours aimed at manipulating a person's access to their financial assets decision making to foster dependence and control and many people don't recognise it.

While 16% of UK adults say that they've experienced economic abuse, when you ask people about specific behaviours that suggested that figure rises to 39%. We want to proactively identify people in that 39%, so that they can get the help that they need. So, we asked ourselves, how can we identify and reach these survivors of financial abuse if their presence in the financial system, financial ecosystem is hidden in the shadow of their abuser?

Initially, we wanted to find women who were using a joint account or transacting on their partners account, which could indicate a coercive situation. But we didn't have the data for that. So, we adjusted our approach. We started with the persona Lisa who was employed part time, but it's financially controlled by her husband.

Machine learning can help identify patterns to reveal potentially vulnerable groups, our solution isn't particularly visual. So, here's a bit of information about the process. We started with a dataset of individuals and their demographic information. Because the data was untagged, we pursued an unsupervised machine learning approach. Using a K means clustering algorithm, we partition to each of our data points (which includes information about a particular person) into a number of clusters. And then once we had these clusters, we analysed them to see if there might be some risk, some groups more at risk for economic abuse.

Our algorithm focused on women in relationships, and we clustered them based on their marital status, age, credit score, employment status, debt and educational background. And we ended up with three clusters. So, as you can see on this slide, cluster, one in green is about half of the population mostly employed women with excellent credit ratings. In blue, we have mostly retired or self-employed women with good credit ratings. And finally, in red, we have a group that reminds us of Lisa, the persona that we focused on. This is a group of women mostly employed and in their 40s and 50s, who have lower credit scores.

This is a proof of concept that we can use clustering to group women based on possible risk of abuse. Next, we'd like to do more clustering within this red group, using additional information like transactional history to pinpoint people who we could help.

So, what's the impact of this approach, we want to turn reactive support systems into a proactive approach while protecting the wellbeing of those that we find. And because we don't need to market and develop a new app, we can start immediately. If we target education to regions or groups that are more at risk, we can prioritise resources for survivors. And once we've started, we can feedback our findings to make the system smarter.

Looking forward, we'd like to expand the scope of our modelling. Currently, we're focusing on demographic information. But we'd also like to include transaction data in future models and test it on real world data. And we'd also like to explore a supervised machine learning approach. It's important for us to engage with experts on economic abuse, so that we can make sure to keep survivors safe. We would also engage with banks and organisations like refuge to find out how we can best help them.

Thanks for your time, everyone. And I'll take questions now.

Nick
Thanks very much, as certainly the first time I've seen a presentation on abuse has a neural network as its mascot, very creative. Sophie, question from you, please.

Sophie
Thank you, um, quick point of clarification for me, perhaps I missed it in your presentation. But once you've done all the clustering, and applied the algorithm and identified those women, what happens next?

Elissa
So, we focus mostly on the algorithm, because we know that there's existing support structures in place through banks, vulnerable customer groups, and also through organisations like refuge to work with people who are experiencing economic abuse. And we didn't want to tread on that expertise. But our intention is to say, Okay, we've got this subset of customers of banks, or just people in general, who we want to reach out to, if possible, but we don't want to put them in more danger while we reach out. So, we can do that through bank branches, through community announcements, things like that, so that we can find those people who might need help and maybe direct them and make them more likely to self-refer to groups like refuge.

Sophie
Thank you.

Nick
Thanks very much Faith.

Faith
And just in terms of thinking about consumer trust in how their data is used, have you considered how you'd expect to explain what you were doing with consumers data overall? So that every consumer was ready to accept what you were doing in the

background with their data, and was signed up to that and felt that they've been informed about how you were using their data to identify vulnerability?

Elissa
Yeah, we haven't done as much work on the data in terms of data usage. But I think the key point is we don't necessarily have to use identifiable individuals for this. We can use anonymized data sets and then target specific regions or Communities are areas or demographics that we know need help without actually taking anyone's names into account. But yeah, certainly if we wanted to process people and then individually identify people, we would have to get their permission to process their data in this way.

Nick
Thank you. We will take a third and final question from Jane, please.

Jane
Thank you. So fantastic presentation. My question relates to how do you how do you glean data about the circumstances that a person is in terms of the, I call it a moment that matters in their life, so if they're a mother or entering a relationship that can actually create quite different new nuances in terms of abuse, but also have influenced the type of solution that they might need and the type of support? Have you thought about how, how that insight can be used as part of solutions as well?

Elissa
Yeah, that's, that's kind of intersection of we'd like to do more modelling on this specific groups. Basically, if we introduce something like transactional data, it will be easy to see when somebody had income reduction, or if they've lost their job. If we have information through the banks know your customer procedures about maybe people have a name change when they go through a divorce or something like that, we can find those inflection points. But unfortunately, the data sets that were provided for the TechSprint didn't include that. So, it is something we would really like to go look at in the future.

Nick
Thank you very much. It's, it's rare that we get to demo eight before someone highlights one of the gaps in the TechSprint provision of technology or data. So, I will pass it on to the team. And we'll see what we can do on the data next time. But thank you for your presentation. And for your answers to the questions. That was Finding Nora.