Final Report

Police 4.0: Connecting authorities and locals for better, safer neighborhoods

Group Intermin #23 (Police 2)

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Executive Summary

Continuous urbanisation drives lots of people in the city. The people become disconnected from each other, sometimes they do know know their own neighbors. City mobility is also increasing making people to visit different neighbourhoods even if they are not familiar with them during the day. People become less responsible for the environment around them, therefore the risk of crime increases, so do the level of safety concerns that citizens have every day. There are no existing channels to address these concerns to the police. The police at the same time has not enough resources to collect and analyse data from the citizens and act on the side of crime prevention. Right now the police is concentrated mainly on the existing crime handling. They would like to pay more attention on the preventive measures.

The challenge is to create a usable and friendly channel for communication between the police and citizens in order to give the opportunity to the people to address their safety concerns that can be used by the police in potential crime prevention. The police can create the potential crimes patterns and link to the geolocation in the city or in the related location. At the same time the citizens concerns will be addressed, it will create the sense of certainty that the authorities are connected with the citizens and are easily approachable if they need any help. Therefore the authorities will be perceived as reachable and friendly by the population.

The solution that we offer is mainly to redesign available tools that can be used as a channel to address low level concerns. One of these tools is the emergency service app 112 Suomi. The main redesign principle is to add a feature that the user could use to send a concern report to the police. Another tool that can be redesigned is the net tips form on the police web-site. We propose to make it more user-friendly and design a survey in a way that the user would fill each question at a time.

We recommend to create an official hashtag for the social media that can be used by the users to directly address the police with the safety concern. The tag #nettivinkki will be easily recognizable by the users and directly connected to the police in the context.

The police can create a data analytics system that will store, process and analyse the data and create a nice visualization of the potential crimes patterns.

We suppose that our proposed solution will not take a lot of time to implement because it is based on the already existing tools and it is quite easy to redesign them though it will need promotion and advertising to raise awareness of the population about them.

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Introduction of the problem

As the digitalisation is transforming the economy and the world, Finnish police is confronted with the challenge on how to harness the transformative technology and improve the services that police has to offer and provide better security to community, city and entire country. The problem at hand is that Finnish police has dedicated emergency hotline however does not have proper channel of communication for services other than the emergency. As a result, customer do not know how to report incidents that might not be the emergency but require attention from the police. Therefore, the police department is seeking to bridge this gap through digital solution which enables department to receive information and act on that information.

The challenge that was presented by the police to us is to design a digital channel for the citizens to better communicate with the police about events that may lead to crime for the purpose of crime prevention. Nowadays the Police can only receive the emergency notifications about the criminal events that are already happening or happened without any opportunity of prevention.

In order to better understand the problem we looked into the work of police from the inside visiting the police academy and talking to the officers about their daily job and issues. We made initial ethnographic research with the attempt to understand the citizens' concerns, and at the beginning our focus was limited only to the possible concerns that can arise in the nightlife in the city. We also made benchmarking of already existing online services for communication with the police in other countries in order to get initial ideas for the future service. During the hackathon hours we were actively analysing the problem and formulating the possible solutions. Each hackathon day we made progress and our idea was becoming more and more visible and tangible. We had different concepts in our mind before we could come up with the proposed solution (which we will discuss later in the designated chapter of the report). In the next chapters we will discuss the target groups of users of the future solution and talk about their perception of the problem. Then we will analyze the tools that are already on the market that can be also taken into account for possible of solution. We will also describe the service design process and how our group reacted to the changes during this process.

The user groups and their concerns

In this chapter we would like to inspect the user groups of the future service and their concerns. The main user groups that we identified, are the police and the citizens. The second group is the broad one, therefore we analysed the Finnish safety report 2016 [1] in order to get the understanding of the crime situation in Finland and which concerns the population might have on the regular basis.

Target user group : The Police

One of the end users of our future service will be the organization that set a challenge for us - the National Police Board (Police). In order to understand how the Police operates, which issues do they have during their work and what would they like to achieve with the help of future service, we made a visit to Police educational facilities and met one of the top trainers of Police Academy in Tampere. We listened to a presentation about the Police and their operations and organization of their work. In addition we asked in depth questions in order to understand each issue better. The methods that we used were mainly participant observations and interviews.

The police in Finland is a very reliable and trustworthy organization. The Police work is highly dependent on the legislation meaning that the Police has a right to perform certain measures only in line with the legislation (only these types of activities that are allowed by the legislation). The Police is focused mainly on the capturing and punishment of the criminals that already committed a crime but they aspire to make measures for crime prevention. Finnish police do not have much human resources to cover all the country with patrols. It is well-known that in the EU it is recommended to have 222 policemen per 100 000 citizens, however in Finland there are only 150 policemen per 100 000 citizens. The Police relies a lot on technologies and digital services that help the police officers do their work. Being able to prevent crimes will make a lot of value to the society and let the Police use their resources more efficiently. That is why there is a need in digital service that allows the citizens to share some valuable data with police about suspicious events.

The police mainly is interested to prevent street violence by learning about the hotspots and sending patrols there to prevent disorder (that is highly connected with the Friday and Saturday night life in the city), property crimes (burglary) and cyber crimes (digital violence in Internet that may cause real crime offline). The most common crime for the Finnish Police is disorder and violence in public places with drunk people involved. Since there are not enough of human resources in the Police to send more patrols in the various area of the city, the patrols should be sent wisely to have an opportunity to prevent crimes and keep the public place in order.

Target user group : The citizens and their concerns

The citizens might have concerns in their everyday life that they want to report to the police. In order to understand which type of concerns they might have, we studied the statistics of crime and safety in Finland [1]. Comparing to other countries in the world Finland is safe and secure environment for living, however the population have concerns in their daily life that they would like to be able to report to the police. According to the Finland Crime and Safety report 2016[1], there are particular crimes in Finland that catch more attention in the society:

- Thefts and robberies. In the summer the street theft potential increases. Petty theft, pickpocketing are non-violent crimes and usually they are detected not at the moment of crime itself but later when the crime has already been done. Personal robberies occur mostly during the late hours[1].
- Sexual assault occur but significantly more rarely than in other European countries[1].
- Alcohol intoxication and crime by drunk people: alcohol usually contributes to the criminal activity. It is usual to see drunk people on the streets after certain late hours, when it is dark, during holidays and weekends. The majority of these people are non-violent however there is a potential of violent or criminal behaviour for the reason of drunkenness[1].
- Cybersecurity issues. Nowadays many crimes has been moved online. Usually it is very hard to obtain valid statistics on cybersecurity crime, because a lot of people even don't know if they are victims of this crime. It is very hard to notice[1].
- Road safety. Road accidents are usually connected with intoxicated driving especially during the winter months (because of icy roads). The statistics of intoxicated driving increased by 0.2% in comparison with 2014 year[1].
- Violent crime. It rarely occurs in Finland in comparison to other European countries however according to statistics, the quantity of violent crimes increased by 3.1% from 2014 to 2015 year. Typically violent crime is connected with the organized crime, bands and motorcycle clubs. The police usually knows about these organized criminal groups and monitors them. The crime rarely targets population, usually it is targeted the members of criminal groups [1].

Personas

According to the most usual crime typology that we developed in the previous paragraph and the target audience of our future service we created the personas of the users. Our 6 personas live in different cities in Finland, have different ages and occupations (Appendix 2). Of course they are different concerns about their every day safety. The common wish of the personas is to be able to report their numerous concerns to the police. So that their concerns will not stay just in their minds but will contribute to the preventive measures of the police.

Service design process

Our idea has evolved greatly during the course from our initial concept that we discussed with the National Police Board. During the kick-off we were quickly drawn to a concept of a service, where citizens would receive feedback based on their 'Citizen Safety Report'. Through automation, tagging and statistical models, the solution would have provided the police a tool which would resource-efficiently provide credible data to plan policing and target the government's concerns to the right direction.

During the hackathon we progressed with the idea first focusing on the low-level disturbances at local nightlife considering ways for the authorities and bar workers to communicate about 'troublemakers' more effectively. When a disturbance moved from one bar to the other, the next bar didn't know what had previously happened, and the situation was allowed to escalate. We wanted to create a platform to get rid of this forgetfulness. However, according to the feedback bar workers have a great incentive to not report minor disturbances to the police as this would get them in trouble with Valvira. We determined this administrative and cultural barrier as something that needs to be removed through legislative change for our idea to work in Finland and chose to change focus.

We continued with a heavy focus on the citizen side of the concept, looking to empower local communities to provide a kind of "Socialhood". In Socialhood people who don't know their neighbours would still be able to share their concerns with their social peers through a platform. Key benefit for the citizens would have been receiving feedback on their reports that the police had acted on. A 'moonshot' idea that was presented was awarding a citizen of the year award - similarly to the police of the year award - for making an effort in building a safer community through invaluable feedback on safety concerns. However, current IT systems likely would not support this type of social environment, although the concept of citizen of the year could still be applied. After the hackathon we decided to pursue solutions that would be easier to implement with current technology and ones that the society was ready for - something that they maybe wouldn't have been with Socialhood.

Reasons stated in the previous chapter directed us to focus on the tools that the authorities use to communicate with citizens. The solution dubbed Police 4.0 will be discussed in-depth in the next chapter. In the solution we recognized the success by the 112 app [2]. Improving the user experience and functionality of this medium, the net tip service online and a creation of social media hashtag for directing police attention were in our mind key enhancements for the toolkit that should be made.

Analysis

In this part we will analyse the existing tools that are already available online. We decided to analyse the available tools because it is much easier to design the service concept around the tools, that are already online and ready for use, than to create the whole new infrastructure for the non-existing service (yet).

We brought our attention to the application *112 Suomi* that is designed and implemented to support the emergency service in Finland [3]. The application is downloaded by more than
700 000 people that is quite a significant number of people in Finland in comparison with the country population . The main feature of the 112 Suomi application is to send the location of the caller to the emergency service. The application was created with the participation of Emergency Response Center Administration which also recommends the population to download the application. The only benefits of using the application when the user calls the emergency number is that it automatically sends his/her location to the emergency centre dispatcher. The user also has the list of the necessary emergency numbers in Finland. It is useful to have on the phone even if the user doesn't hold it in the memory. The 112 Suomi application is used not only by Police but by the other emergency services that operate in connection to the Emergency Response Center Administration (medical emergency, firefighters and others). So it is not dedicated only to the police cases that are urgent. However the app has a big potential to extend its functionality and not only limit it to emergency services. Our idea is to bring a new function of reporting the concerns in order to make the app more useful for the end user.

The police web-site offers a number of opportunities to report a tip to the police (apart from online offence report about the crime). When the user opens the main page of police web-site there are clear links to contacts which the user can use to communicate the tips with police. There is a page with the numerous telephone numbers of the police for the tips reporting [5]. Also there is a special page for net tips report that the user can fill in online [4]. The user can submit anonymously (if needed). The form can be used to submit non-emergency cases, therefore it can be used as a source of concerns. The main questions of the form are: which kind of concerns the user reports about? The form offers several answers with the explanation of each ot the answers that is very handy for the user who is not sure about the category of the report. Then another question is where did the user made the discovery of the concerned event. There are answers provided. Mostly the answers are connected with online environment: web-site, chat, email etc. If the user chooses one of the answers he/she will have to add more specific information about the web-site or other digital space that he/she is concerned about. We did not notice any special field to write the location of the concern which was received by the user offline, in the natural environment. Then there is a field for open question in order to write the detailed description about the concern. The questions that the police wants to see in the report (what, where, when, location of the event) are only mentioned as a recommendation questions

in the form. In our opinion the form is not enough well structured and is not enough user friendly.
There is always a room for improvement in order to make the process smoother for the users. The user may be worried and overwhelmed by his concern and the process of filling in the net tips should be easy and as much enjoyable as possible. In the next chapter (Solution) we will propose the variant of redesign of these existing services (112 Suomi application and net tips on the police web-site).

Solution

Our solution includes the redesign of 112 Suomi application and net tips form that will be used as an interface between the population of Finland and Finnish police. Through this interface the people will share their concerns, send related pictures, text, audio and video files to describe their concerns about safety.

Since social media is a very powerful tool where millions of people are engaged daily, we will introduce also a part of our solution that will help the people to address their concerns directly to the police through available social media, and the police will be able to find these concerns just clicking on the #hashtag that people will use while posting about concerns and unsafe events. The third part of our solution is the design of the special data analysis system that will sort and analyse the data and will create and visualize patterns of events that the population is concerned about. The police will be able to see the visualization of the crime patterns and use this importation to act on preventive measures. In this chapter we will discuss the possible redesign variants of the app and net tips report (nettivinkki) and propose the name of the hashtag and explain the principles of data analytic system.

Redesign of existing tools

As a solution in our case is to redesign the existing tools that are available online.

112 Suomi redesign

The existing 112 Suomi application has only one main feature: it sends the location of the caller to the Emergency Center. We propose to add the feature for net tips in the mobile application. So that the user will have the option to submit a concern report that will not be sent to the Emergency Center but directly to the database of the police that will store the information and then provide the analysis and crime patterns. We provide some designs of the possible solution. We just add the feature of reporting the net tip. If the user wants to use it, he/she just clicks of the relevant “net tip” tab. Also we think that from the perspective of the user the location coordinates can be confusing and not easy to read by the human. Instead of coordinated the app will display the map with the geotag of the person’s location. The

application will still send the exact coordinates to the Emergency Center but the user will see the friendly and more understandable map location on the screen of the application.

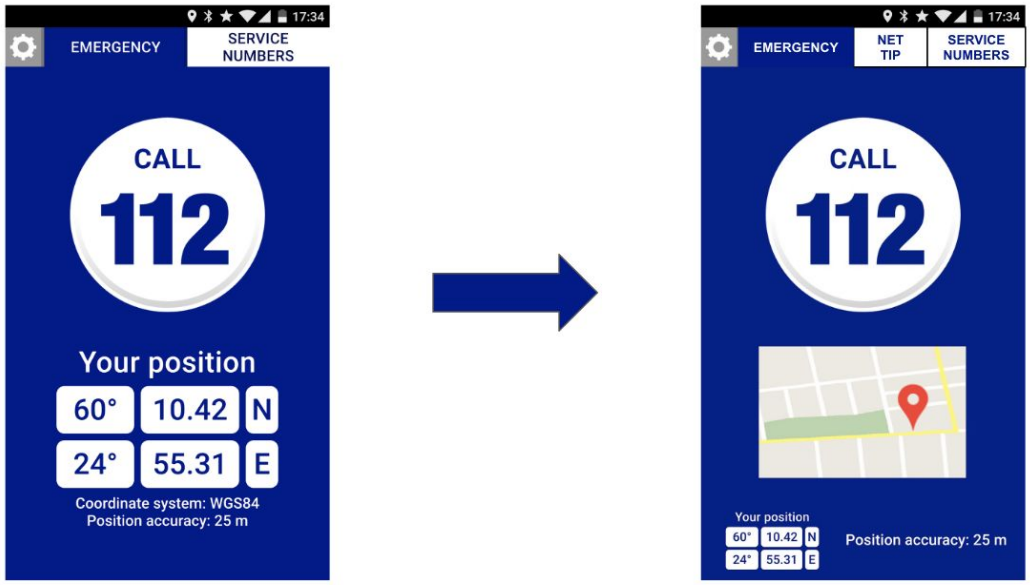

Figure 1. Recommended redesign of the 112 Suomi app: existing main screen vs redesigned main screen.

Net tip redesign

The net tip form on the web-site of the police, in our opinion is not enough user-friendly. There is a lot of information that the user has to process at once in order to answer the question of the report form. It can be confusing and overwhelming. The new design trend of the online survey forms is to ask one question at a time. The online survey services for instance like Typeform offer a solution that is very pleasant visually and very user-friendly, it is so easy to fill in answering each question at a time, the user does not have any chance to skip the question because he/she noticed another complex question in the form and lost his concentration. As a variant, we made the net tip report form in Typeform online survey service and made a demo video of how the user can fill it in [6]. The couple of screenshots of the demo survey form are provided here (Figure 2).

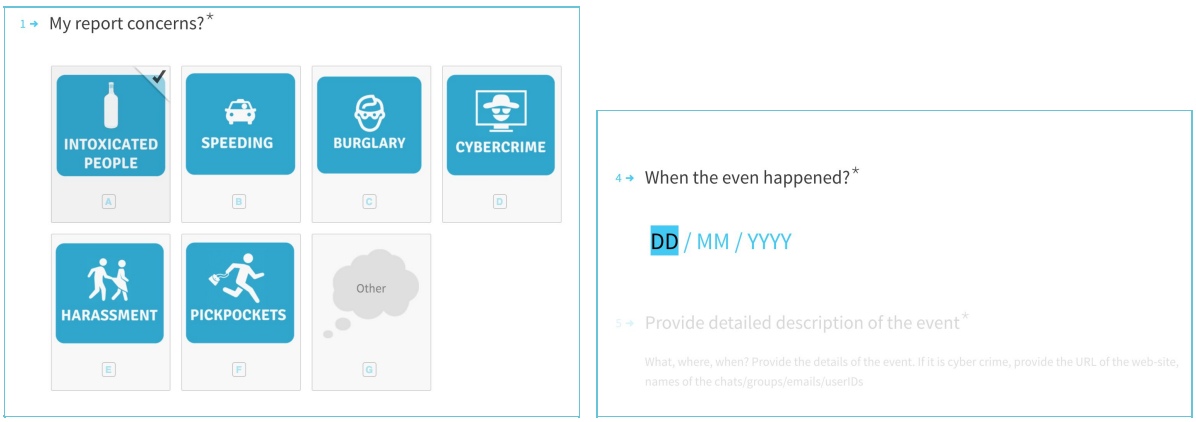

Figure 2. Recommended redesign of the net tip report form.

#NETTIVINKKI hashtag

Social media is a very powerful tool that people are using every day. It can be used as a reporting tool to communicate directly with the police. The social media accounts of the police serve mainly as a digital vitrine of the police but not as a communication interface between the population and the police. It is not possible to submit any net tip via social media directly to the police accounts. To make it possible we propose the special hashtag that can be used to communicate concerns and net tips to the police directly in the social media platforms. The police can click on the hashtag and receive all the tips submitted by the people. There is a big variety of leading social media platforms that use hashtags: Facebook, Instagram, Twitter. All of them allow the users to submit media files (photos, videos) and text comments. There is an opportunity to leave the geolocation tag for each of the posts, so it will be visible where the concern - event happened. In this way the police will receive all the useful information in the most handy way from the point of view of the users who use social media pretty much everyday.

We propose to use **#nettivinkki** hashtag. The story behind nettivinkki is well known in Finland. The police started using nettivinkki or net tip on their website to collect information about questionable and criminal activity online. In the past few years this medium for reporting was on the news for the Finnish police's campaign on tax evasion - in the form of pizza restaurants. Upset citizens flooded the service, and other channels with information about pizzas that cost under six euros. Internet and social media in particular can be a difficult tool to harness effectively.

Nettivinkki sometimes is used for memes and internet jokes. Of course the police should be ready to sort these humorous post out but still we expect the hashtag to be used mainly for concern tips reporting. The main reasons for usage of #nettivinkki hashtag are that this hashtag is well recognizable by the population in Finland. It is brief and unique. This hashtag is clearly linked to the police and at the same time it is not connected with the emergency services. There is no reason to confuse the #nettivinkki concern reports with emergency reports. This hashtag can be a useful addition to the existing application and web-form. It will create a modern, quick, familiar and easy channel of communication between the police and the citizens. The data that the police will receive under the #nettivinkki hashtag can be sorted and analysed by the data analysis solution that we will describe later in this chapter.

Data analysis

The aim of the data analysis is not just to summarize the data but to turn data into actionable insights. What we are aiming here is to make a risk forecasting and early warning system. In order to do so we recommend to use the spatial risk analysis method rooted in the crime analysis

theory of risk terrain modelling. "What risk terrain modeling (RTM) does is to identify the risks that come from features of a landscape and model how they co-locate to create unique behavior settings for crime" (Kennedy & Caplan, 2016). Risk terrain modelling is a statistical process which essentially tries to model the crime based on the geographical correlation. Furthermore, spatial dynamics of crime may vary from one setting to another and this model can be customized to fit Finnish environment to get more comprehensive picture.

On top of risk terrain modeling crime repeat pattern and data from social media can be used to make more robust forecasting model. One way to incorporate social data would be to use public accessible API (Application Program Interface), API's are essentially a backdoor to access the data systematically and legally from the vendor. For instance, Twitter and Facebook's API can be used to see what kind of topic and discussion are trending over the social media in certain geographic area. This can help in early warning system. Similarly, repeat pattern analysis also can be used to predict the crime at certain location. Repeat rate can statistically modelled using generalized linear models. All of the above mentioned statistical modelling can be performed in open source platform like R and Python which makes the process feasible and economical.

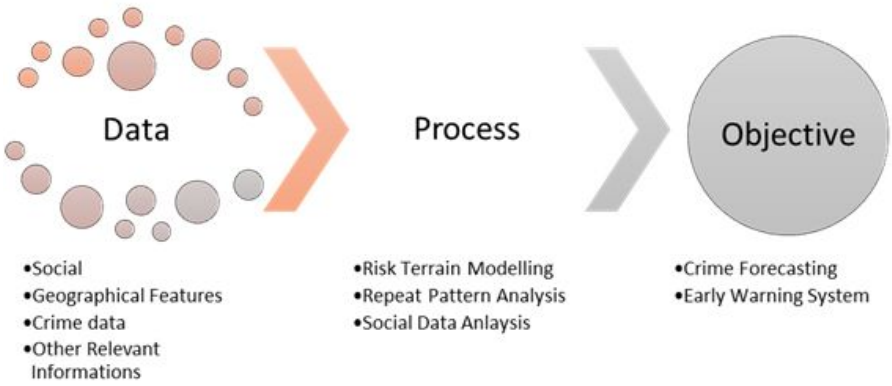

Figure 3. Summary of Data Analysis

Service in the police data flow

The service will address the concerns of the population. The population will interact with the police using the mobile application, online report form and various social media using the hashtag #nettivinkki. All these solutions that will be easily accessible and user-friendly in order to offer the best user experience for the population. The police will be easier accessed and will be perceived as more friendly organization that is opened for communication with the citizens. The interface will collect the data that will be analyzed by the data analytic system that will visualize the patterns for probable crimes or suspicious events. This information will be used by the police for prevention of possible crimes. This prevention data in line with other police services (emergency, crime report and other online services) will build the whole picture

of data flow (Figure 4) that is available and can be used by the police in their everyday operations.

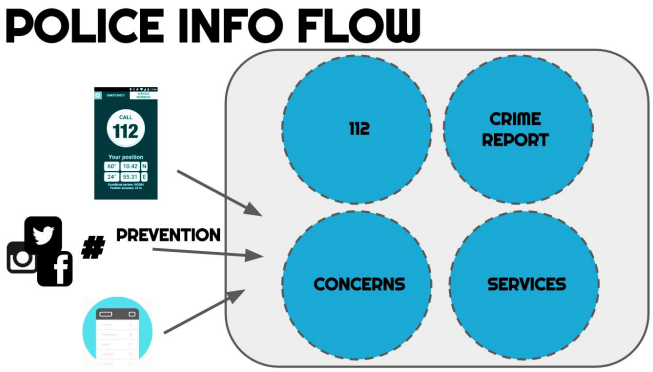

Figure 4. Data flow of the police

Implementation status

The project is in the initial stage of implementation. At the moment there is only a concept and a service idea. Since there are some tools already available, the redesign of them will not take a lot of time. Everything will depend on the police and their resources and ability to implement the project but we forecast that it can be implemented in the first half of 2017 year.

Recommendations

1. Redesign the 112 app and add the features of sending the net tips that will be available to the police.
2. Redesign the net tips form on the police web-site and make it more accessible and user-friendly.
3. Launch the official hashtag for the social media.
4. Create the data analytics system.
5. Promote and advertise the new police communication channel in the society.

References

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Appendix

1. Implementation and benefits

	REDESIGN COMMUNICATION TOOLS	USE SOCIAL MEDIA #NETTIVINKKI
IMPLEMENTATION	H1/2017	H1/2017
ADDED VALUE	BETTER UX	CONVENIENCE FOR TIPPING
ADDED VALUE	MORE OUT OF EXISTING SYSTEMS	INCREASED REACH AND TIP RECEIVALS
ADDED VALUE	EASY-TO-USE TOOLS BOOST WILLINGNESS TO REPORT	CITIZEN PARTICIPATION

2. Personas

Basic information

Name: Ryan	
Age: 25	**Occupation**: student
Location: Helsinki	**Salary**: 700 euro/month

Relationships

Family/marriage : no	
Friends: yes	**Networks**: maybe

Lifestyle	Tech. capabilities	Personality
- Football - Going out at night	- Bachelor degree - Computer - Mobile phone	Extrovert ✦ Introvert Sensing ✦ Intuition Thinking ✦ Feeling Judging ✦ Perceiving

Needs	Pains	Desires
Feeling of general security	Facing the act of violence. Does not now what to do	Place where everyone feels secure

Basic information

Name: Piia	
Age: 55	**Occupation**: shop worker
Location: Savonlinna	**Salary**: 1800 euro/month

Relationships

Family/marriage : married, 2 kids (19 and 21 years old)	
Friends: childhood friend Maija, dog Mira	**Networks**: Facebook group for dog owners

Lifestyle	Tech. capabilities	Personality
- Goes out with the dog every morning and after work - Water gymnastics	Ok with using computer. Has the basic smartphone. Likes to make long phone calls.	Extrovert ✦ Introvert Sensing ✦ Intuition Thinking ✦ Feeling Judging ✦ Perceiving

Needs	Pains	Desires
Quick and easy to use service	At work it is too busy to use the phone for the report.	That she does not want to work alone.

Basic information

Name: Lisa	
Age: 25	**Occupation**: office worker
Location: Helsinki	**Salary**: 2500 euro/month

Relationships

Family/marriage : single	
Friends: childhood friends, school and work friends	**Networks**: job-related, alumni-, hobbie networks

Lifestyle

- Dancing
- Yoga
- Fitness
- Creativity class
- Women in tech

Tech. capabilities

Business background. Learning technology in her free time.

Personality

Extrovert ✦ Introvert
Sensing ✦ Intuition
Thinking ✦ Feeling
Judging ✦ Perceiving

Needs

I don't want to worry about security during the evening hours. I want to move around without limitation

Pains

Being harassed or followed by drunk men on the street or in public transport

Desires

- Freedom of expression
- Elimination of safety concerns

Basic information

Name: Jonne	
Age: 13	**Occupation**: student
Location: Northern Helsinki	**Salary**: 0 euro/month

Relationships

Family/marriage : parents, he is the only child	
Friends: Matti, Teemu	**Networks**: Classmates, relatives, online friends

Lifestyle	Tech. capabilities	Personality
- Uses bicycle to get to school everyday	Knows everything about apps and games	Extrovert ✦ Introvert Sensing ✦ Intuition Thinking ✦ Feeling Judging ✦ Perceiving

Needs	Pains	Desires
Channel to report unsafe encounters	Difficult to reach police/ school officials/ other adults	- No bullying - Safety on the road while cycling

Basic information

Name: Aarne	
Age: 79	**Occupation**: pensioner
Location: Salo	**Salary**: n/a

Relationships

Family/marriage : wife passed away, grown up children with kids	
Friends: friends from elderly daily activities	**Networks**: children and grandkids in other town

Lifestyle	Tech. capabilities	Personality
- Reading news paper - Yle Pune - Avara Luonto	Baffled by computers. Likes chatting with grandkids on Whatsapp.	Extrovert ✦ Introvert Sensing ✦ Intuition Thinking ✦ Feeling Judging ✦ Perceiving

Needs	Pains	Desires
Wants to be the eyes of the neighborhood	Can't report through 112. Too tiresome and unsafe to yell at troublemakers.	- Less noise from pesky meddling children - Gangs noise

Basic information

Name: Sergeant Roger	
Age: 31	**Occupation**: police
Location: Helsinki	**Salary**: 3000 euro/month

Relationships

Family/marriage : married, 2 kids	
Friends: yes	**Networks**: union at work

Lifestyle	Tech. capabilities	Personality
- Running - Sports - Sauna	Baffled by computers. Likes chatting with grandkids on Whatsapp.	Extrovert ✦ Introvert Sensing ✦ Intuition Thinking ✦ Feeling Judging ✦ Perceiving

Needs	Pains	Desires
More resources, Help and assistance, More info from the citizens	Reduced number of police officers. Cannot pay attention to all the cases	To serve the country the best way. To receive the medal.