

## People's perception and expectation of AI capabilities

*Analyzed with KNIME analytics platform*

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<b>Abstract</b>	
<p>Nowadays, Artificial Intelligence (AI) has become one of the most popular terms. We hear and discuss it almost everywhere. In the news, technology articles, businesses, and we regularly discuss its current and future position. Some people have concerns about it developing, and some people are happy with it and believe AI helps humanity and makes our life easier, more secure, and of course very fast to solve the problems.</p> <p>Here in this thesis, we concentrated on one questionnaire survey that was given to the people, and we tried to understand people's points of view about AI. In this paper, people's given answers were analyzed via the KNIME analytics platform to understand what they know about AI, what they are expecting about it, and how realistic their expectations are. We made different kinds of filters of the results to compare different groups to each other such as Finnish, Non-Finnish, high educated, and other kinds of filters. Also, we compared already existing researches about the same topic to get a better result about people's thinking about AI.</p> <p>In the end, via KNIME data mining, we saw the prediction of data and people's views about the future of Artificial Intelligence. Finally, I warmly thanks to Dr. Amir Dirin who guided me as my supervisor in a very nice way with the patient.</p>	
<b>Keywords</b>	
Artificial Intelligence, Machine Learning, Deep Learning, AI's future, AI's benefits & threats, Big Data, Algorithms, KNIME analytics platform, Data Analyze & Mining	

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## Abbreviations

AI	Artificial Intelligence
AUC	Area Under Curve
DL	Deep Learning
DNA	Deoxyribonucleic acid
ML	Machine Learning
ROC	Receiver Operating Characteristic
URL	Uniform Resource Locator

# 1 Introduction

## 1.1 *Technology revolution*

Humanity has been facing many technological and industrial revolutions, and each of these revolutions have been affecting the way we live. For example, the industrial revolution in the 18th and 19th centuries pushed people to go out of villages and live in cities to work in factories. It made a new society, new communication, and new problems (White Matthew, 2009).

After the industrial revolution, technology has been evolving all the time. It affected more than all other changes which had happened before. Humanity and people's relations between each other and also between behavior changed in very deep mode (Buchanan Robert Angus, 2019). Before technology people needed each other to solve the problems and this need made small and big communities between them. But after technology, most of the needs were solved by technology and people didn't need each other like before.

The technology was growing in a very fast way and people didn't have enough time to handle the new situation (Handly Emer, 2018). Nowadays, every single day we face new things which are developed and surprise people in different fields (Technology in Our Life Today, 2020).

On one hand, new technologies make people's lives simpler, but on another hand, it creates new problems such as losing jobs, pulling out people from social life and making them alone with lonely problems and disasters related to it (Stall Eugenie, 2019).

In the last decades we have heard new elements like Machine Learning (ML), Big Data, Artificial Intelligence (AI), Algorithms, and some other terms which people don't know exactly where these technologies are going and what will happen after all these technologies are completed. These technologies are at the basic level at the moment which do not affect people's lives in a very big way, but as each day is passing, very easily we can see some parts of these technologies in our lives. Especially in working and labor factories, these new technologies could work cheaper and better than humans and many people could lose their jobs just because of new technologies (Chui Michael, Manyika James and Miremadi Mehdi, 2016).



## **1.2 People knowledge about new technologies**

Many people don't have a deep knowledge of these new technologies. Especially most people don't know the differences between machines which work with special programs and others which working based on Artificial Intelligence technology. Indeed, they don't need to know in detail what it is and how it works.

Most of the people have a negative background about these technologies and sometimes this kind of thinking coming from adventure Hollywood movies which robots could take a leading and managing role in the future and humanity will be robots' slaves. Those robots which don't have any morals, philosophy and senses and they could not understand people's feelings.

Some parts of that thinking could be true if the development of new technology is going in the wrong direction. All things which are going to happen in the close future depends on us, how we are directing it and what kind of role we give to them. For under control directing, we need deep knowledge of it to be more effective in voting and directing process. Especially nowadays many countries that lead new technologies, ruled by democracy means at the endpoint people will decide the direction of development and programming. Because of that, it is very necessary for people to have a little right knowledge about each of them especially to pressure the developers about mentioning morality and humanity in the development process (Joyce Connor *et al.*, 2018).

## **2 Research questions**

In this study we pursue to answer the following main research question by understanding what people's perception on the AI future trend are. To tackle the main question, we will answer the following sub-questions:

1. What do people think about AI?
2. What do people expect from AI?
3. How realistic is the expectation?

## 2.1 People thinking about AI

Artificial Intelligence is relatively new terminology for most people. Indeed, it was created about 70 years ago but in the last decade, it came to the people's attention and they started to use it (Foote Keith D., 2016). In many cases, there is a big misunderstanding between AI, machine programming and code Programming cases (Kharkovyna Oleksii, 2019a). In this research, we will create such questions that show the level of people's understanding about AI. Figure 1 shows that in traditional programming, the programmer put program and data as input and based on that get an output and result, but in Machine Learning, other machines or programs' output is one of the many inputs for the machine. In ML, the algorithm learn based on the experiment and educate itself for the new situation. Besides that, it gets different types of data and gives a percentage of comparison and model program as output.

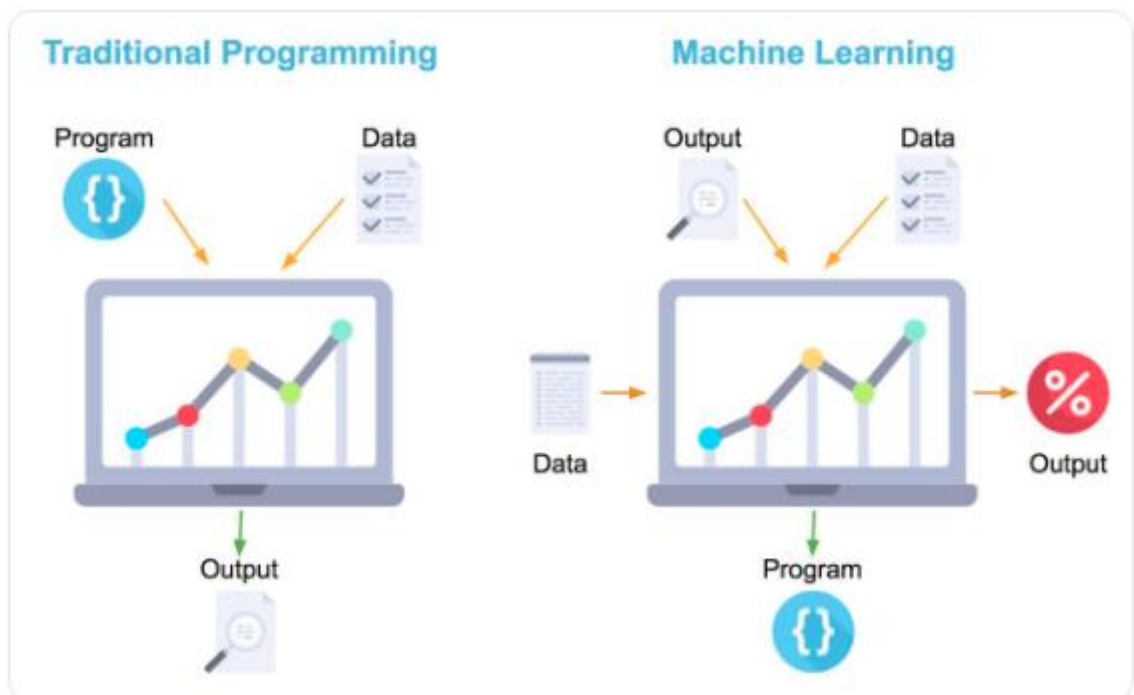


Figure 1. Traditional programming vs ML (Kharkovyna Oleksii, 2019a)

How people perceive AI is an important study. How AI technology affected people's lives and whether makes their life easier or more complicated. What kinds of feelings they have for AI technology and at what level is it acceptable for them in their daily life.

Many people are already using basic AI technology in smartphones, but do they realize that it is AI. For example, google maps shows car traffic in the streets and many people can see and follow it but the majority of them can not realize that it is work based on AI

technology. The understanding of AI is very important because based on that people can know if it is useful or not. Sometimes we decide on new things based on propaganda and media without a deep understanding of it (Manzaria Johnnie and Bruck Jonathon, no date).

## **2.2 *People expecting from AI***

This part of the questionnaire target people's expectations from AI. How they see AI's position in the future and how they hope for it to be. Do they let AI technology develop day by day without limitation or do they hope for a stopping point for it?

We will also try to understand how they feel living with developed AI technology in their daily lives. Many jobs will transfer to the machines which use Big Data and AI, and how will it affect people's lives after knowing this truth (Anand Abhyankar Sanika, 2018).

In this part of the survey with questions, the people's point of view is our aim. Especially young people who will face benefits and challenges in the close future, and it is important to know and understand how they will adapt to new life systems and technologies such as AI.

Replacing AI with human work is one of the biggest challenges which the young generation could be worried about (Manyika James and Bughin Jacques, 2018). Here we will try to understand what kind of role they gave to new technology and what is expected from AI to do and not to do.

## **2.3 *People's' expectations realistically? (scope and limitation)***

Using and developing AI has already started whether we like it or not, and it is going forward day by day. In many fields, we are happy about using robots and Artificial Intelligence because it makes our life easier and safer. For example, in surgery rooms, they are helping doctors to understand illnesses right way, and they are more exact than humans (IEEE, 2018). The death range in operation just because of doctors' mistakes is really high and ML with AI already decreased this range in a mentionable way (Clarke Jr. David A., 2016). Another example could be car traffic and car accidents which new cars with AI decreased accidents as well.

In this part of the questionnaire, we will try to understand people's thoughts about scope and limitation. On one hand, people are happy to use ML and AI benefits and on the other hand, they are worried about many things which they don't like machines to take a role in particular parts. For example, human morals and senses are something which we couldn't accept from machines or we could not believe they can do the same role as humans do. Many of our habits and activities come from our nature which we carry in our Deoxyribonucleic acid (DNA). This means we as a human are not learning them but we are coded with unknown codes in our DNA. How could machines and AI replace these kinds of roles? How could they learn our human habits which we didn't learn from our family or school? How could they understand different cultural actions and based on that decide to do their own activities. Our DNA and behavior is full of secret things that we didn't learn in school or books and those things come as evolutionarily to us. For example, we could have very different reactions to the same joke. If we hear that joke at a wedding party, we laugh loudly but we would not laugh at the same joke in a funeral. And we also have very different reactions to the same joke in different situations, and even those situations change from one culture to another.

Our questions are based on those scopes and limitations which we will try to understand how important those are for different cultures. It could especially be a big difference between the west and east countries and also between highly educated and low educated people. We will try to reach different type of people from different countries as much as we could to get more realistic and exact answers.

### **3 Related technologies**

#### **3.1 *Machines and Robots***

Robots before AI technology were working based on programming and coding, meaning robot programmers wrote commands for every possible condition, and robots or machines would act based on those conditions. For example, smart windows actions are based on codes for different conditions. If it is sunny, put dark glasses on, and if the weather is cloudy, open white glasses, in very hot conditions, open windows, in very cold conditions close all layers of the window and so on. All these conditions described beforehand are programmed based on each situation. These kinds of robots or machines do not need very complicated algorithms and also these kinds of machines cannot learn from other

machines or devices, or even humans unless someone upgraded ability code for new things. This means they are constant, and they can't update themselves.

For such devices and machines, the creator has to think about all possible conditions and write a program and code for those conditions. In case some conditions are forgotten, that robot or machine cannot do anything, and it can send only an error message to the programmer and he/she could update it. These kinds of machines are very limited in action and they are related to the human brain all the time. They can't learn from behavior and they can't understand other programs.

On the other side of classic machines and robots, we have such machines working with Artificial Intelligence (AI). AI based solutions such as Deep Learning (DL) which is a subset of Machine Learning (ML) enable to design and develop robust robots. Figure 2 shows the different AI based approaches.

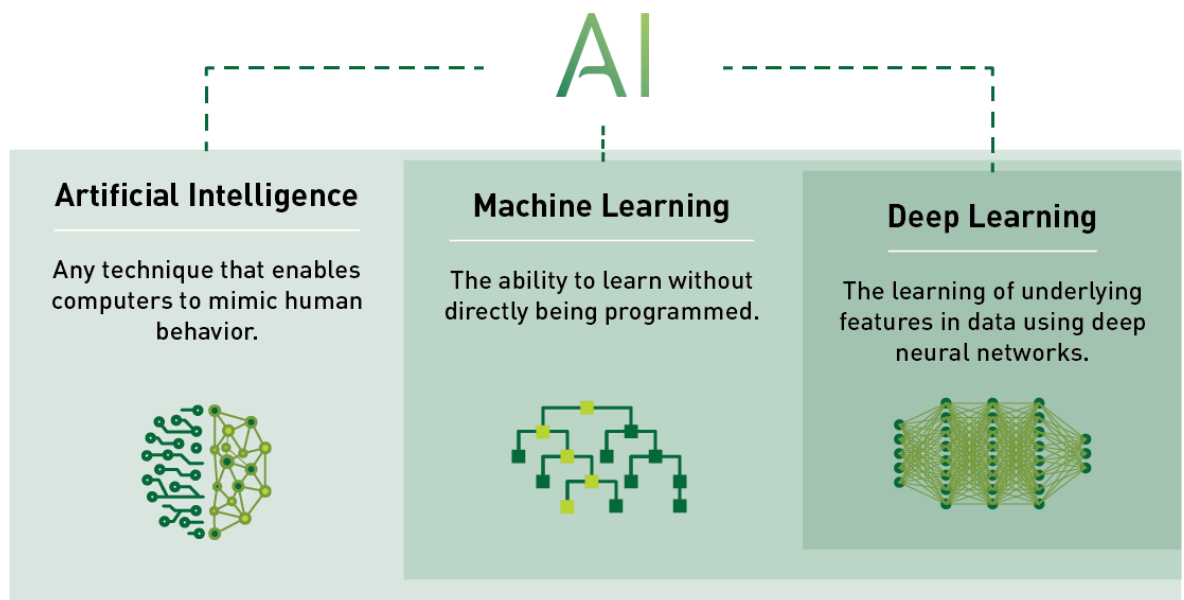


Figure 2. General Definitions of AI (Kharkovyna Oleksii, 2019b)

### 3.1.1 Deep Learning (DL)

Deep learning is based on neural network science which learned from the human brain. The human brain can recognize different kinds of information and data based on experiences and things learned from childhood in kindergarten and school (Kharkovyna Oleksii, 2019b). Children start to make categories based on learning and from that they compare different kinds of data to understand well. For example, if one child knows 10

kinds of birds, she/he will get general information about birds' properties and could recognize the 11th bird even if he/she sees that for the first time. Maybe they don't know the name of the bird, but at least they know it related to birds category and it has any kind of bird's ability like flying, having wings, and etc.

In DL, machines use almost the same method but based on getting data from the source to compare. Machines in DL get information and divide it to very small data to compare with others. In each comparison, it goes forward to the next hidden layer and again compares every single data with other single data in the previous layer. Each layer's result goes forward to the next layer and the same process goes forward until they reach the last layer of data which is output and answer (Hargrave Marshall, 2019).

In this technology, the machine need a big amount of data and all processes based on data. Big data has a very big role in this process and with small amount of data, the percent of the right answer and right solving decrease. Here machines cannot create data and all the time need data from the outside to solve new problems. After the problem is solved the new result could be used for future data and problems (Kharkovyna Oleksii, 2019b).

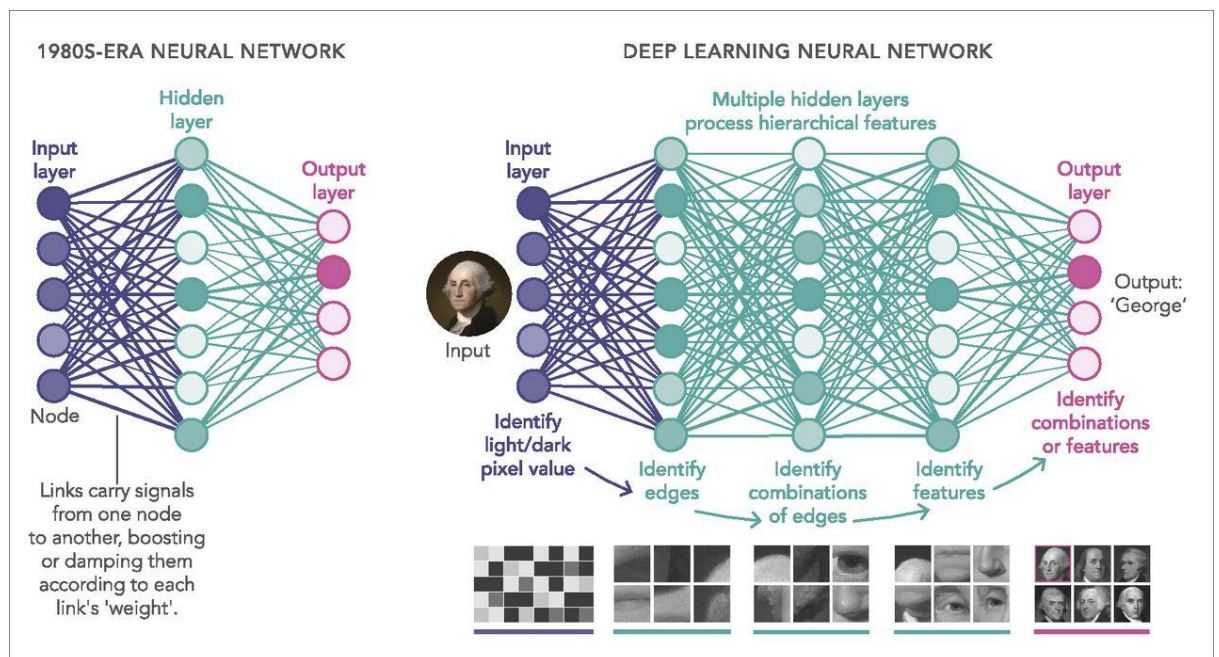


Figure 3. Deep Learning Revolution and Neural Networks (Kharkovyna Oleksii, 2019b)

### 3.1.2 Machine Learning (ML)

As shown in figure 4, ML also uses the same method and algorithm which DL uses but in ML it could extract more features before classification (Kharkovyna Oleksii, 2019b). In ML, the machine does not depend totally on pre-given data and information, and it could also get some features and data from current data. It is also not a pre-coded application and in each step could find new data that it didn't have before (Rencberoglu Emre, 2019).

After we input data to a machine in ML, the application tries to find known features from that input data. From each process the machine itself learns new experiences which in machine language we could name as information for future needs. After recording different types of information, it could create some solution to solve the question and give the output of that. Unlike classic codes, machines in ML could create new patterns to learn and recognize independently and make predictions in the output process (Oppermann Artem, 2019).

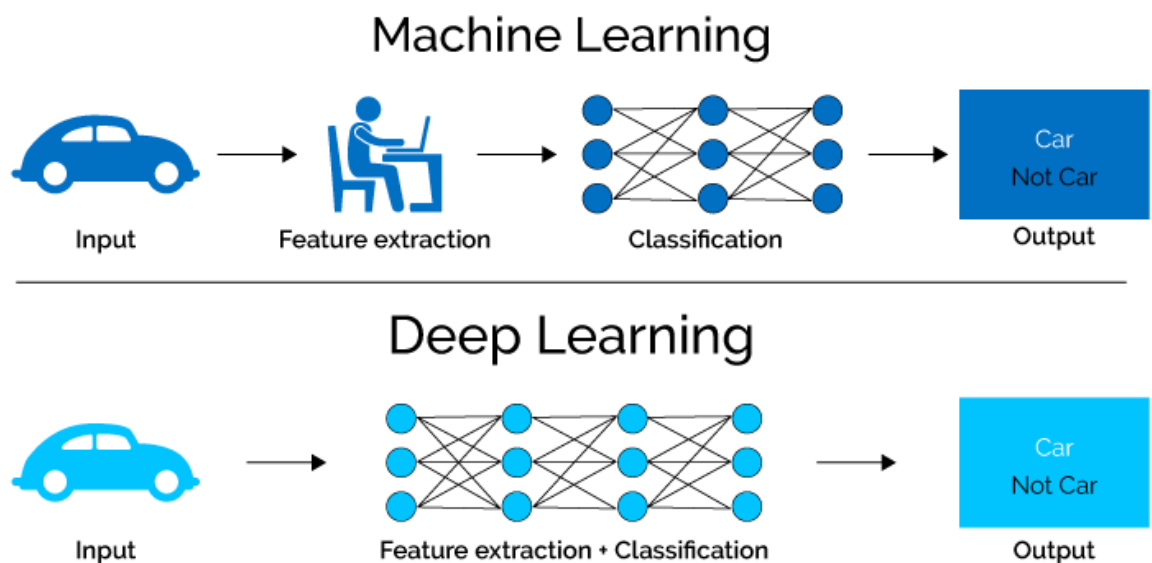


Figure 4. Machine Learning vs Deep Learning (Oppermann Artem, 2019)

### 3.1.3 Artificial Intelligence (AI)

The AI journey started in 1950 by a man named Alan Turin. Actually, the idea was hidden in Greek philosophy where they wanted a model human which could think as a system of symbols.

In 1950 Turin published a paper that shows machines could be described as thinking.

Scientists then combined Big Data with AI to handle complex tasks. AI is based on data and in comparing different types of data, to understand the case and make a decision about it.

AI ideas developed very slowly with small steps. In the 1970s when scientists discovered new ideas about the human brain called neural networks, engineers developed AI, based on the new discovery. In that time two of the major challenges was the shortage of enough memory and processing speed problems which in that time technology had very big limitations for these two challenges (Foote Keith D., 2016).

AI is any code, technics or algorithm that enables machines to develop and demonstrate human behavior. In this technology, machines need to learn and act like humans and be able to create new data from existing data. It recognizes patterns in the input data and it could simply search inside a big amount of data. In one word, AI could think and decide what and how to do something. Figure 5 show AI's developing timeline which started from 1950<sup>th</sup> until now.

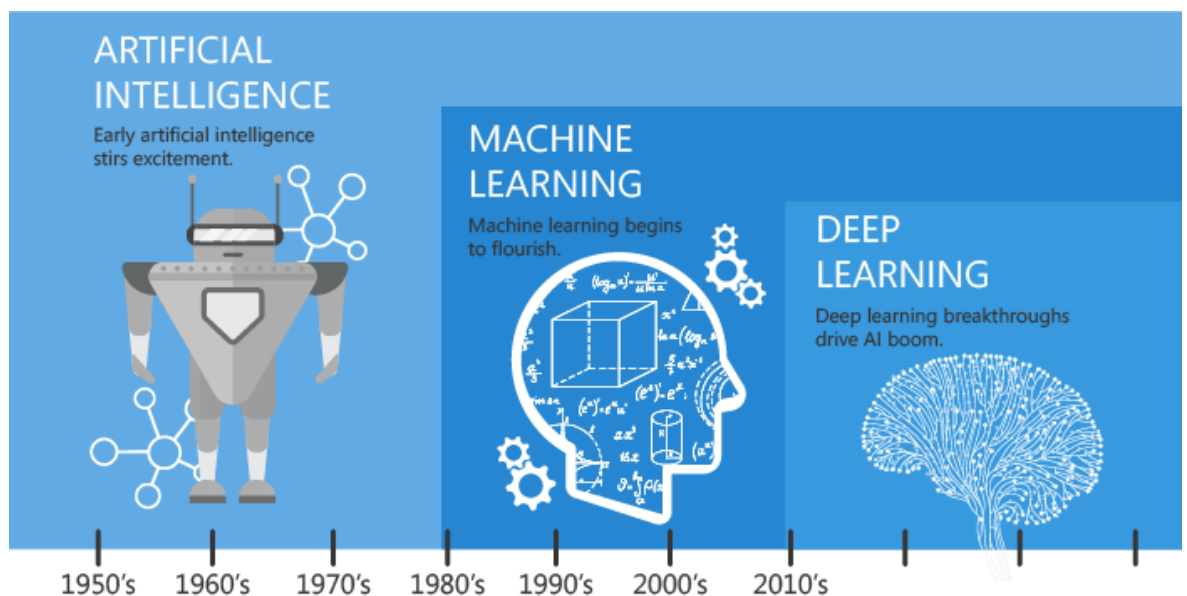


Figure 5. AI's developing timeline (Oppermann Artem, 2019)

Until this time, AI has not developed so much but it is now developing very fast. Especially in the last two decades even normal people could see and use AI even if they don't know that they are using it. AI is one of the major parts of our smartphones with many applications like maps, ads, transportation based on location and many other features (Jacobi Udi, 2019). We can see it in the advertisement sectors on our phones or



computers which nowadays devices find users' mentality and needs and send the information and needs to the services to provide good and related services from there (Kaput Mike, 2019). For example, 20 years ago when we were using some web pages in computers, we saw very general ads in which most of them were not interesting to us and we didn't need those things at all. Something related to women is not interesting for men and vice versa. At that time computers couldn't even recognize the users' gender, but in current time based on AI technology we could see those ads which we need or could be interesting for us. If two people open the same webpage in different computers, they see totally different ads insides which both of them find interesting- Based on our search, our favorite lists, visited webpages, clicks, and many other activities, the computer knows the users' habits, hobbies, political views, and many other things. All coming from our daily use of data which could be named Big Data and all these are a very huge amount of data that each user creates every day. If we add social network activities for this, we almost open our mind and heart to machines and they could collect all data to use in necessary needs.

In many cases, people ask about health or other kinds of problems from search machines to get help with problems he/she does not want to share with his/her parents or parner. this means that machine via search engine could know a very secret part of a user's life that a very close person to him/her doesn't even know about. These kinds of searches and data make people more visible and well known to machines and from that data, AI could decide video or music streaming, ads, political news, shops, and etc. for people.

One of the other examples of AI which we are using at the moment is google map traffic display. When users use google map, they see some green, orange, and red colors in the streets. Green means no traffic at all, orange means light traffic and red mean heavy traffic. In the first view, we think that the map gets this information from radars, but it using AI technology and get from other people and drivers in the traffic. When most of the drivers connect to google maps, based on AI technology it could understand for example in A street which the normal speed limit is 60 km/h, most of the drivers drive 30 km/h which shows light traffic in that area. Or if they are totally stopped in the street, means that it is heavy traffic there and could show red color for that part and suggest to other drivers to use another street (Nations Daniel, 2019).

Actually, in this simple example AI technology is doing many other analyses and gives good advice for users and other related services. For example, it could mathematically count users' journey time, suggest other fast ways to reach the destination, showing closed or under construction roads, and etc. Figures 6 and 7 shows how Google map

service gets information from active cars and how it shows the situation for others in google map traffic service (Wirth Elias, 2018).

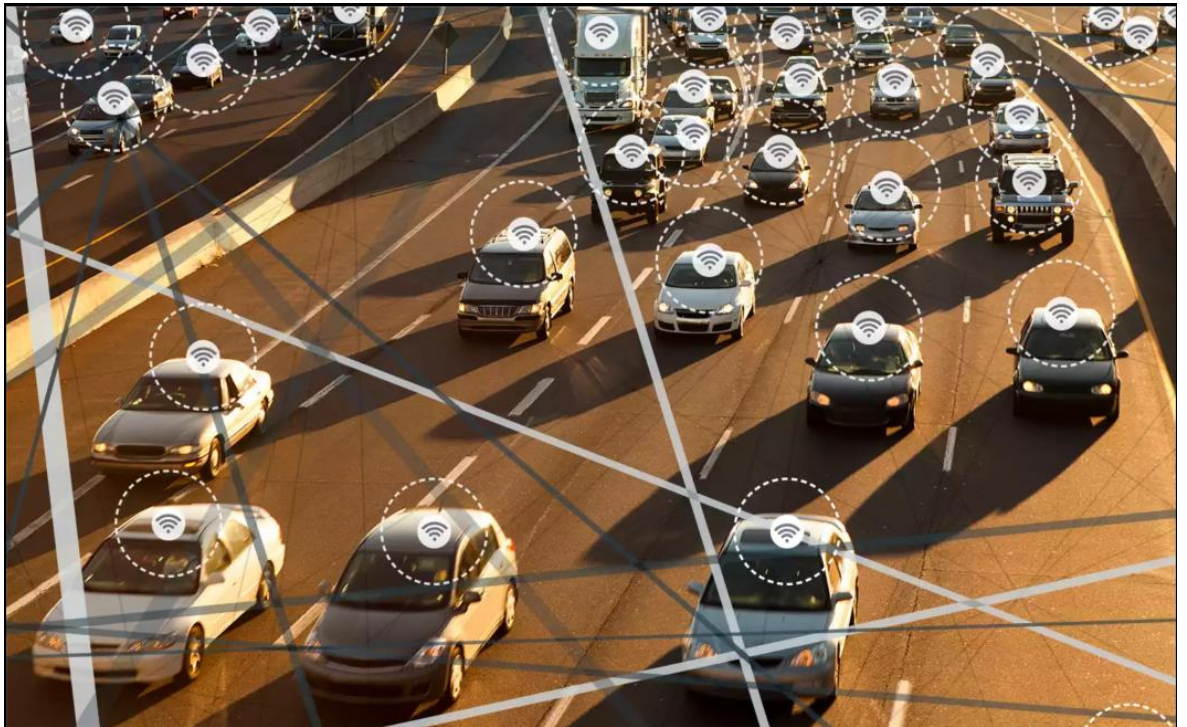


Figure 6. How Google Traffic get data from cars (Nations Daniel, 2019)

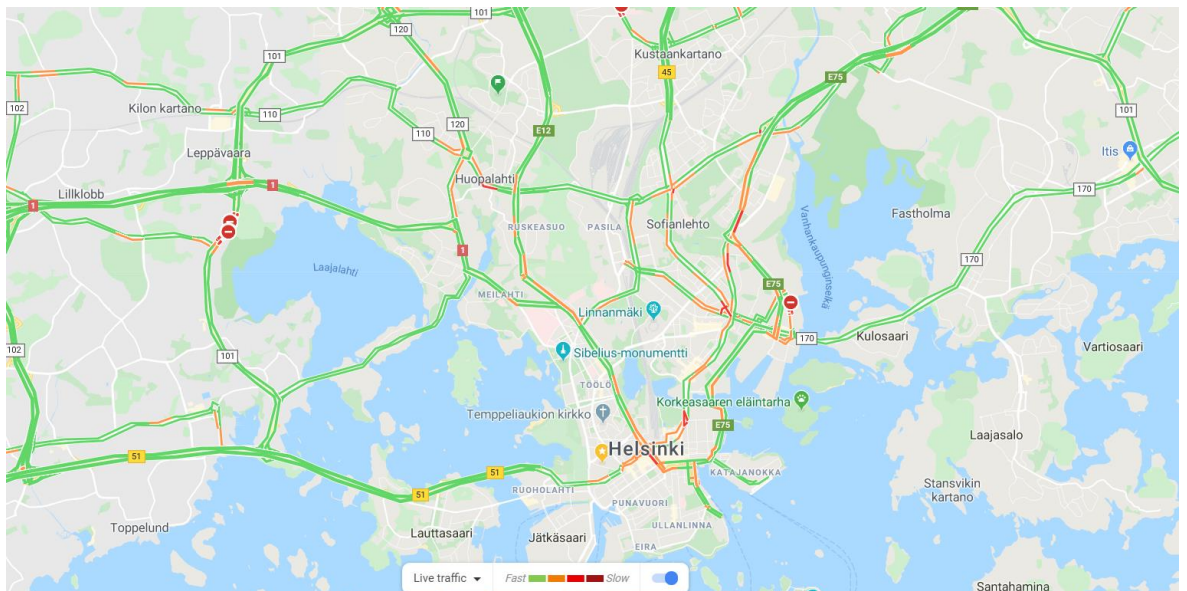


Figure 7. Google maps online traffic view

The image below shows some general theory and facts about AI and human worries from Future & life institute which published was as Benefits and Risks of AI article in 2016.

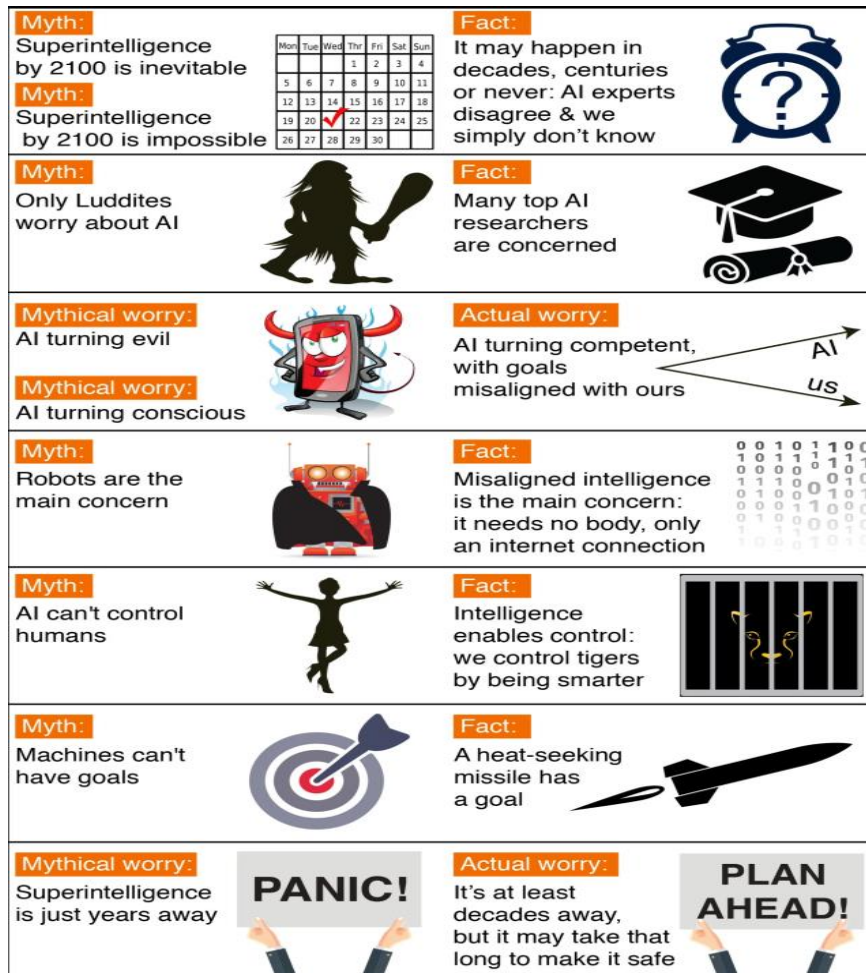


Figure 8. Benefits and Risks of AI (Tegmark Max, 2016)

## 4 Research methods and research design

### 4.1 Survey method

In this survey, we needed to know people's point of view and opinion about Artificial Intelligence and technologies related to it. Because of that, we chose the questionnaire method to reach this aim. "A questionnaire is a research instrument that consists of a set of questions or other types of prompts that aims to collect information from a respondent" (Bhat Adi, 2020). There are different types of questionnaires such as Mail questionnaire, In-House questionnaire, Telephone questionnaire, and Computer questionnaire. Here in this survey we chose the Computer questionnaire type and sent question Uniform Resource Locator (URL) link via different platforms to people.

Our goal was to reach the answer to three main questions about AI. What people think about AI, what they are expecting from AI, and the realistic expectations was our goal to get data from. Because of that our main questions are designed to reach the answers to these questions. It was important to reach our goal with fewer questions and because of that, we worked carefully on the questions to get the exact opinion we needed.

The questionnaire itself had three parts as demographic part, main questions about AI and not required text part to get more feedback and comments about AI from responders.

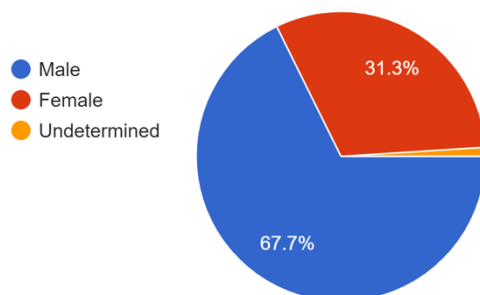
Besides people's opinion, we needed to look at other related researches about this issue and compare the results with ours. Because of that, searching on the internet about different topics, was another part of the research. It was important for us to compare already existing results with our results at the end.

#### 4.2 Participant

We have collected 99 answers during 3 weeks of the survey. As shown in figure 9 to figure 11, 67.7% of the participants were males and 31.3% were females with 1% preferring not to say their gender.

The graph below shows the age slice of participants. The majority of them are from ages between 20-30, 31-40, and 41-50 which 69.6% of all participants are from 20 to 50 years old. We had 14.1% of people from school ages which means they are under 20 years old and 7.1% of people are over 60 years old.

1) Gender  
99 responses



2) What is your age slice?  
99 responses

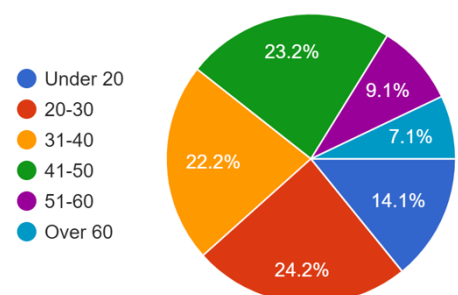


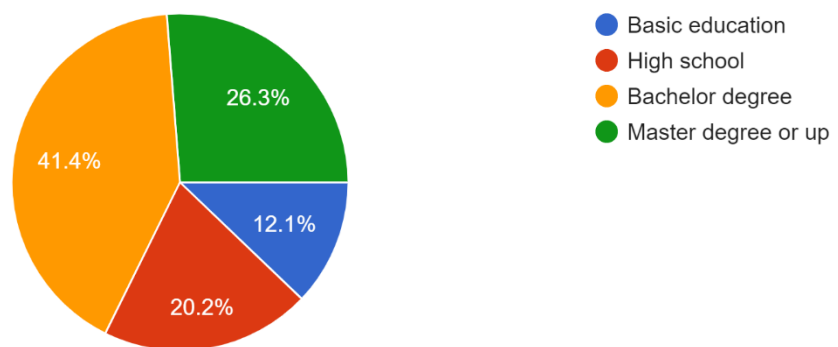
Figure 9. People by gender and age slice

As the education level, 41.4% of participants have a Bachelor's degree and 26.3% of them have a Master's degree or up. If we only count those people who have an academic education we could see from the graph below that 67.7% of participants have a higher education degree.

If we compare this result with age slice, we can easily see that the basic education group belongs to young participants which were about 14% of all participants.

### 3) Education

99 responses



*Figure 10. People by Education*

We had many international people in this survey. The majority of participants were Finnish. In some cases, with two nationalities beside Finnish which altogether was 39% Finnish and 12% Finnish with the second nationality. Besides that 9% Iranian, 7% Russian, 4% Azerbaijanian and so on. The graph below shows nations result in different colors.



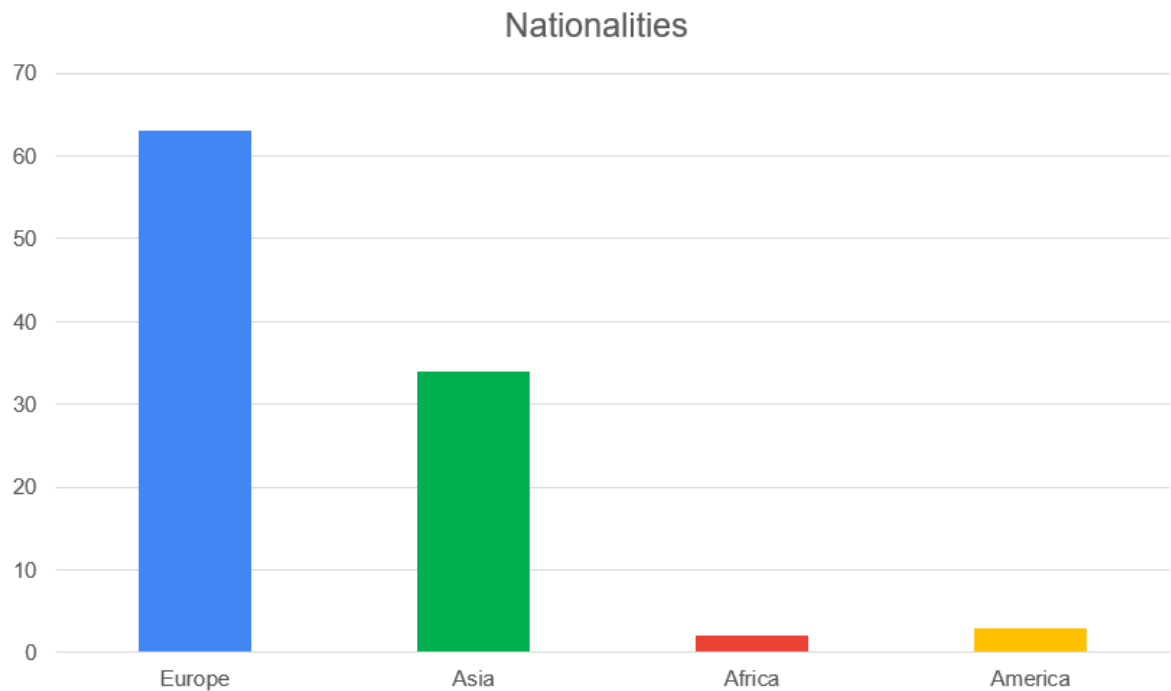


Figure 11. Participant's nations in survey

### 4.3 KNIME analysis

In this section, we are going to analyze our data in the KNIME platform. The KNIME Analytics Platform is the open-source software for creating data science. Intuitive, open, and continuously integrating new developments, KNIME makes understanding data and designing data science workflows and reusable components accessible to everyone (KNIME Analytics Platform, 2020).

KNIME is a popular and open-source platform, which analyzes data in data science to automate the data science process. It works via thousands of nodes which each have a special duty to do (Sewwandi Udeshika, 2018). To reach the aim, we have to create a series of special nodes in which each of them have a special act in data based on our aim. Each node has a configuration form to manipulate our needs and work with each node. We could drag and drop each node to KNIME workbench and connect to the other nodes there. A series and collection of nodes create a workflow in KNIME which could execute locally or in the web portal (Sewwandi Udeshika, 2018).

As shown in figure 12 from the left panel of KNIME which named Node Repository, we need to choose different nodes to get data from outside KNIME platform and manipulate, view, and analyze it. In our case, because our data downloaded as an Excel file from Google form, we need to create an Excel Reader node to get data from that special file. In the node's configuration part, we could choose file direction and any other advanced setting based on our needs. In the next step, we will add some other nodes to clear and extract the exact data that we need to analyze or see.

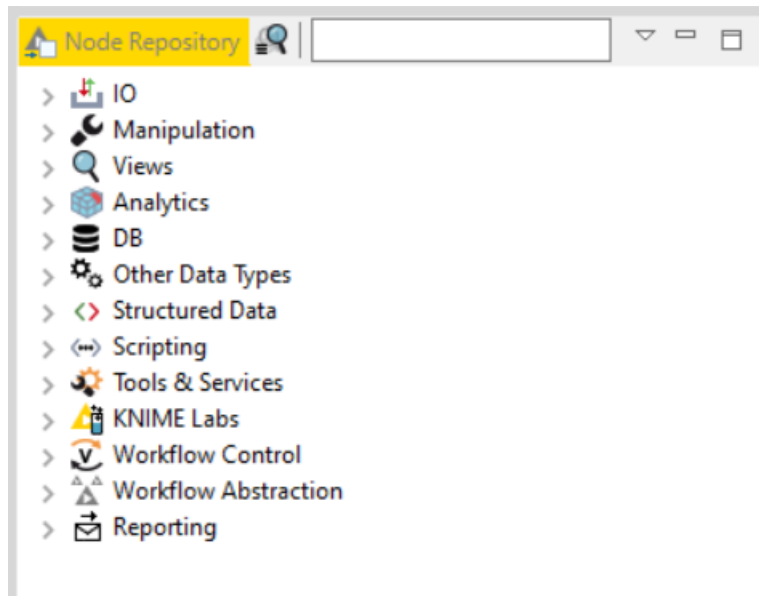


Figure 12. KNIME Node Repository

#### 4.3.1 People Education in KNIME by gender

In the workflow below we want to know the education percentage based on gender. For this aim, we first added Excel Reader node to get data file from desktop, then Column Filter node to remove all columns except gender and education. After that, we have to filter row based on different gender as male and female and for each line, we could add a Pie Chart node to view the percentage of each.

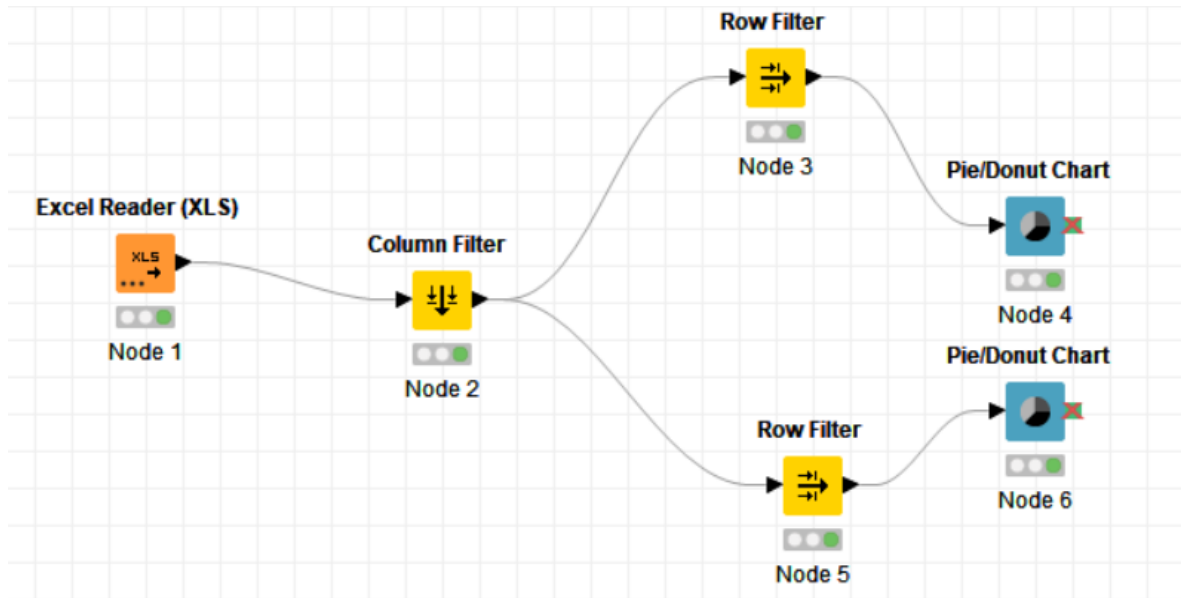


Figure 13. KNIME workflow to filter education by gender

Two charts below show Male and Female education in our survey which we can see as a result of the workflow we did for this aim. 5% basic education, 27% high school, 43% with bachelor's degrees and 25% master or up degrees for males and 29% basic education, 3% high school, 39% with bachelor's degrees and 29% with master or up degrees for females. Also shown basic education and high school education difference for males and females. Reminding that 67,7% of participants were male and 31,3% of them were female.

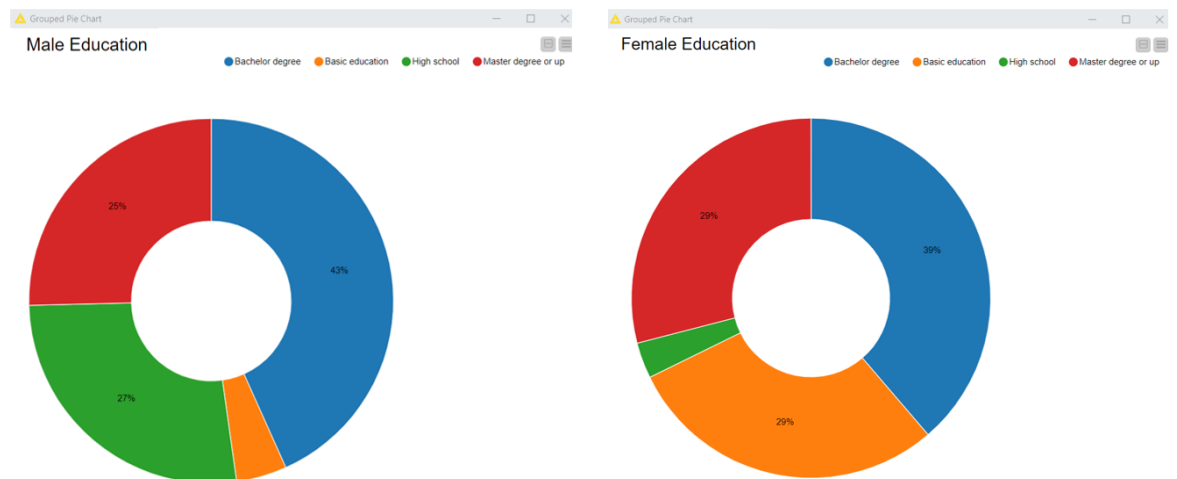


Figure 14. Sample of male/ female's education percentage



### 4.3.2 Survey questions result for high educated people

In this section, we removed basic education and high school rows and only leave high-level education as Bachelor and up degrees point of views. Here it shows what people with high-level education think about each question.

Figure 15 shows the process of filtering those rows which relate to basic and high school education. The result of this part will help to understand the difference between the two groups of people and how education affect people's points of view.

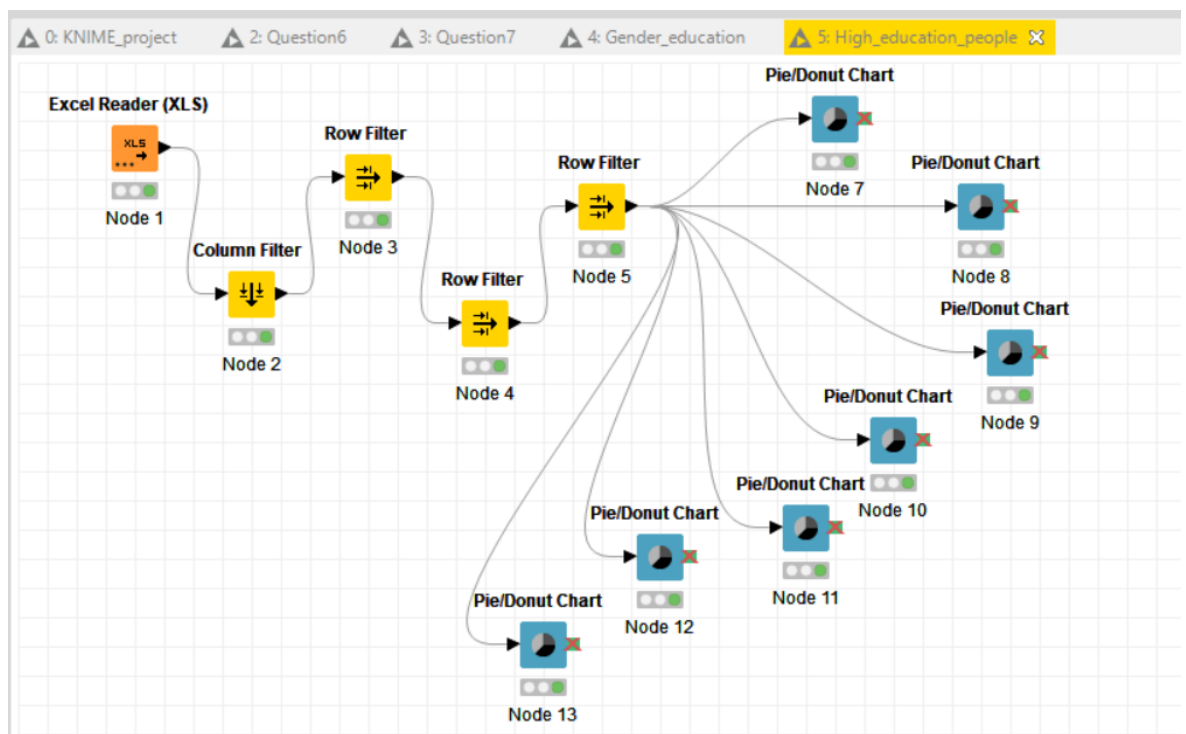


Figure 15. KNIME workflow to see only high education peoples result

Figure 16 shows all results in one sunburst chart in KNIME which is dynamic and when hovering over colors, we can see more details about each of the questions. We did each question separately as well and added all charts related to questions to the appendix part.

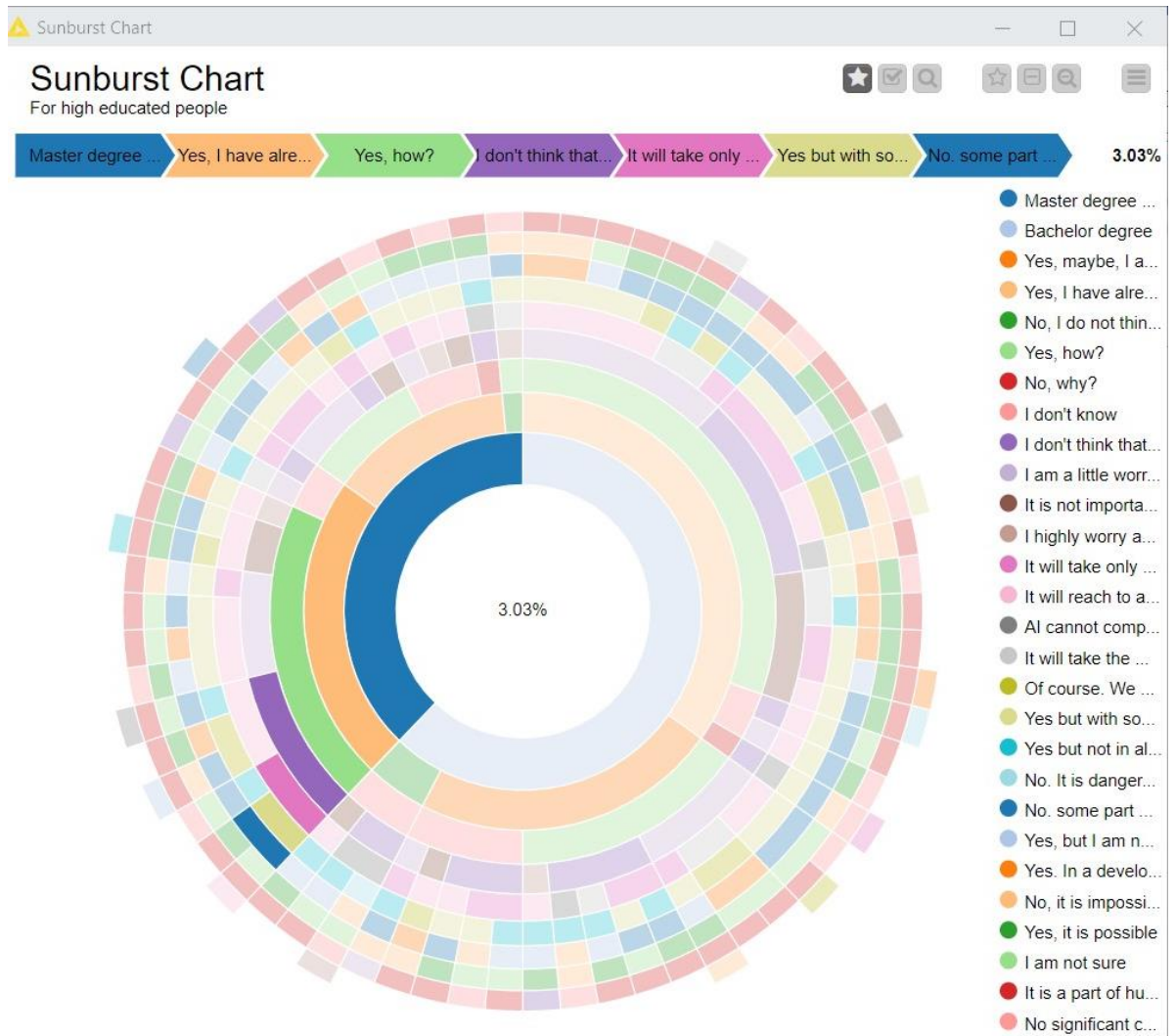


Figure 16. Sunburst Chart for all questions for high educated people

Educated people have a little more positive opinions about AI. For example, as shown in the figure below 75% of educated people believe that AI helps humanity. This percentage was 71.7% in the general view. All other parameters also are a little positive than the general view. Have to mention that 67% of general participants are highly educated people and these people point of view is already shown in the general chart as well. This means this comparison is not between highly educated and low educated people.

## Do you believe that AI helps humanity?

High education people's point of view



I don't know No, why? Yes, how?

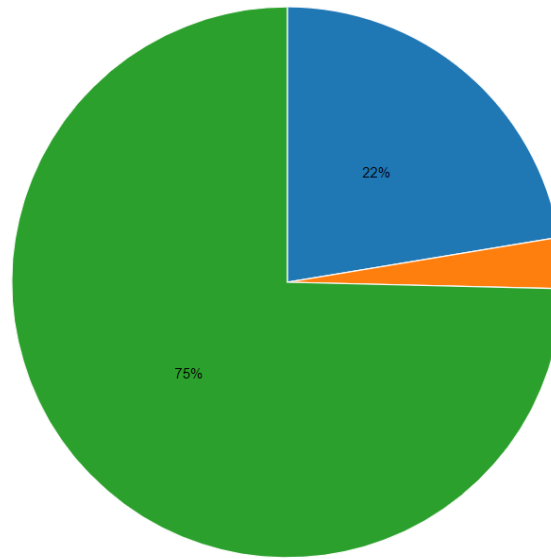


Figure 17. Is AI help humanity or not from high educated people opinion

As another example, 57% of educated people believe that they already used AI-based solutions and this percentage is 53.5% in general results. All graphs could be seen in the appendix part in detail.

### 4.3.3 Compare between Finnish and Non-Finnish people

In this part, we are going to compare the results between Finnish people and non-Finnish people. We are doing this analysis via KNIME as well. As shown in the workflow below, we started with reading Excel file via Excel Reader node. Then the data divided into two parts as Finnish and Non-Finnish. In each line, we filtered columns by need and calculated values by Value Counter node. After column rename in each line to have a better and right view in the chart, we joined two lines with Joiner node and get results in a bar chart view via Bar chart node.

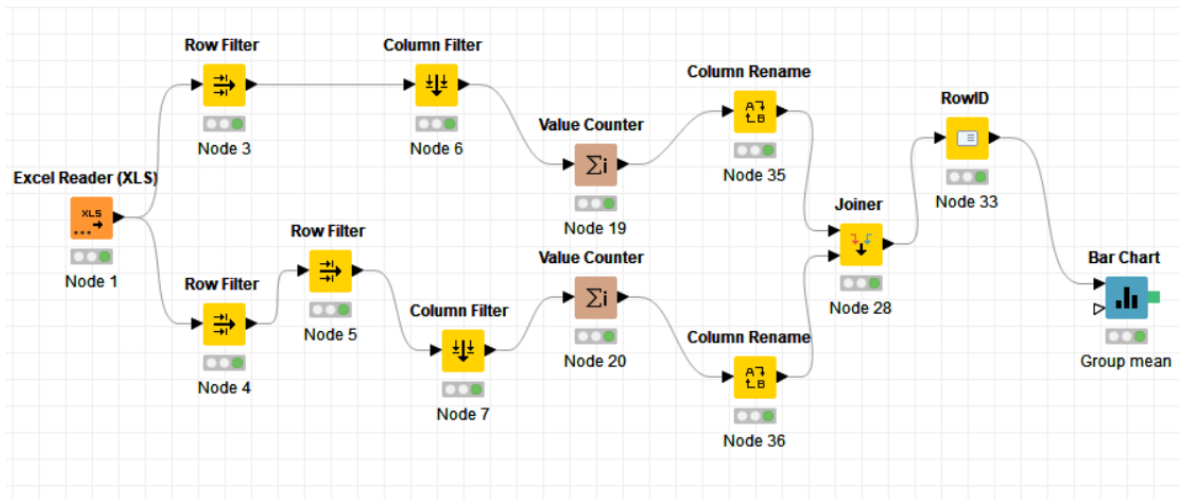


Figure 18. KNIME workflow to compare Finnish and Non-Finnish people's point of views

The bar chart below shows the difference between how Finnish and non-Finnish think about using AI-based solutions. As shown in the chart, the results between the two groups are close to each other and in both parts of Yes answers, Finnish people are a little more sure about already using AI than non-Finnish people.

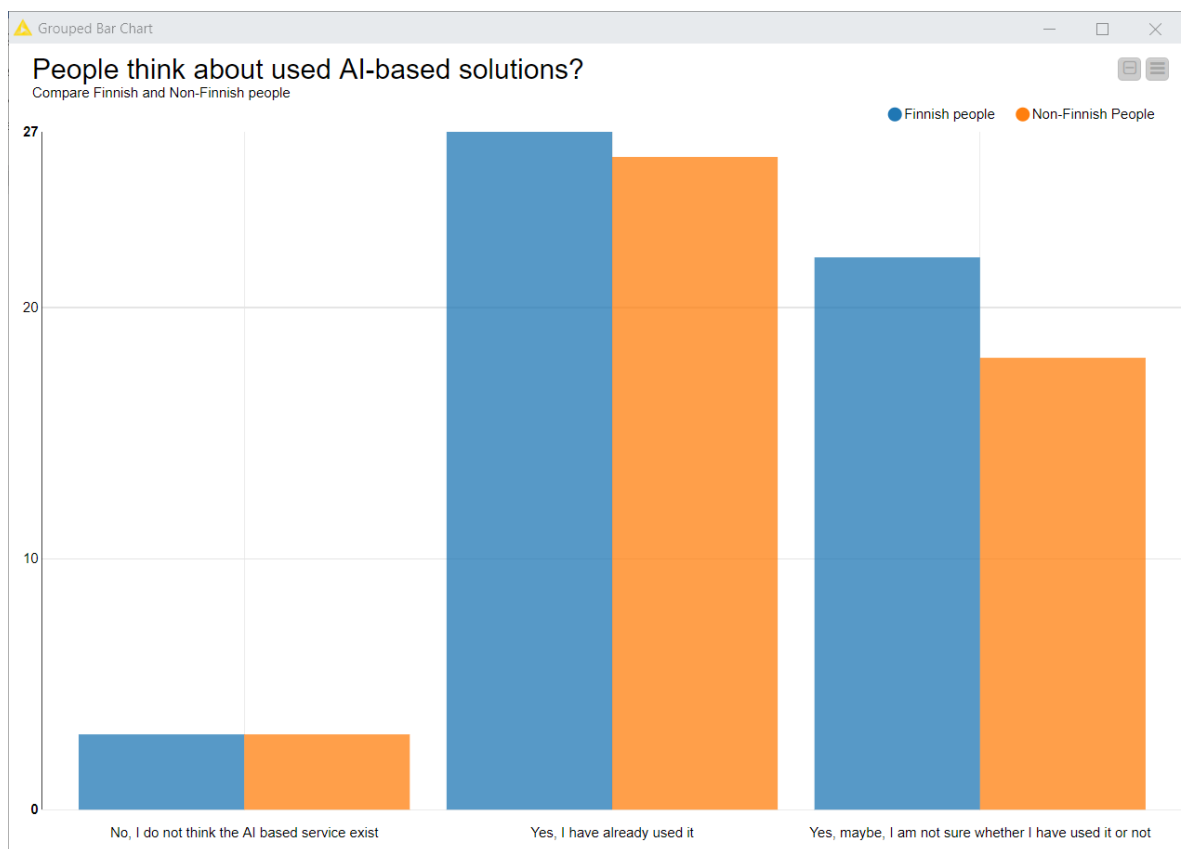


Figure 19. KNIME bar chart for showing difference between two groups

In helping or not helping AI to humanity, Finnish people are more unsure than the other group of people. In the first part in comparison with non-Finnish people, 17 people Finnish people answered that they don't know if it helps humanity or not, but in the other group only three people gave that answer. Also the number of Finnish people who believe AI helps humanity are less than non-Finnish people who are 30 and 41 people.

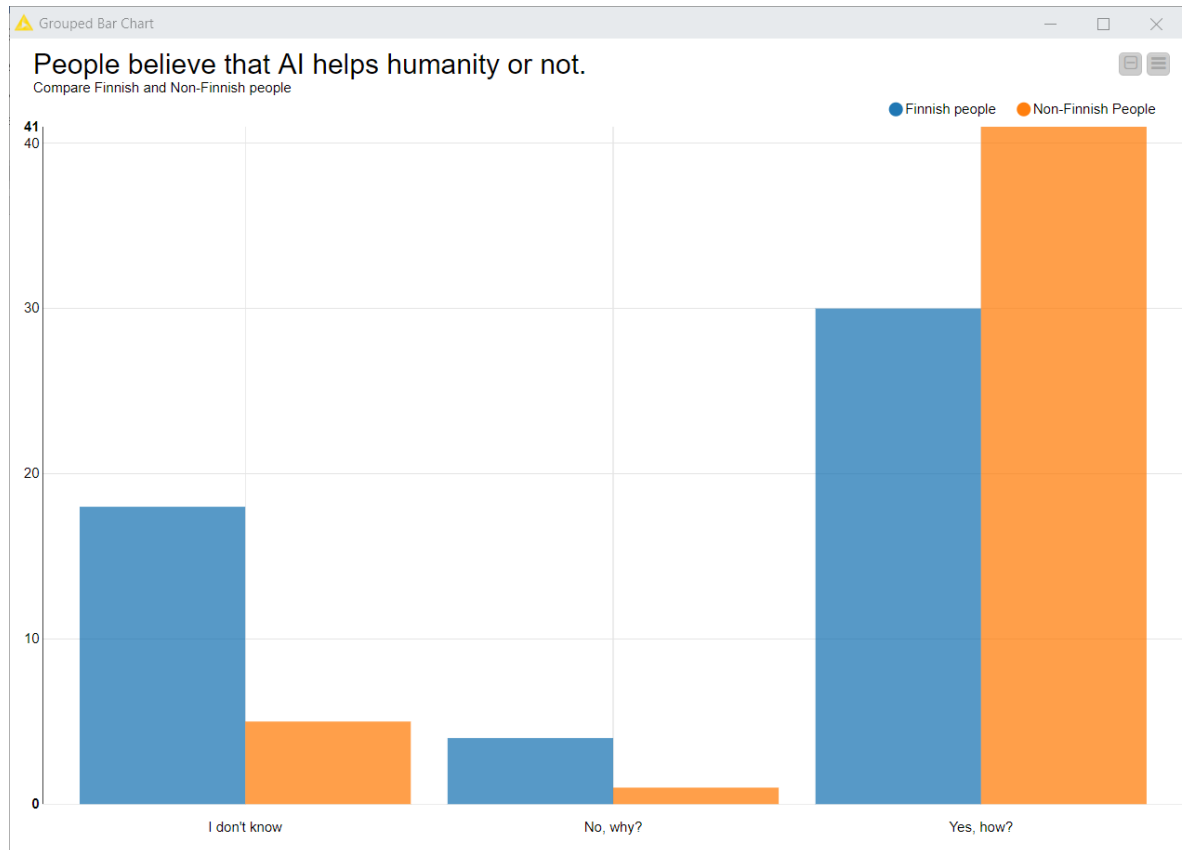


Figure 20. Difference between Finnish and non-Finnish about help AI to humanity or not

One of the questions was about AI affecting people's jobs and how they are worried about it. From the bar chart below in comparison, we can see that Finnish people are not that worried about AI developing and they have less anxiety than the other group of people. Nine people from each group said that it is not important for them and in other cases, 21 of Finnish are a little worried about the case in comparison with non-Finnish which is 18.

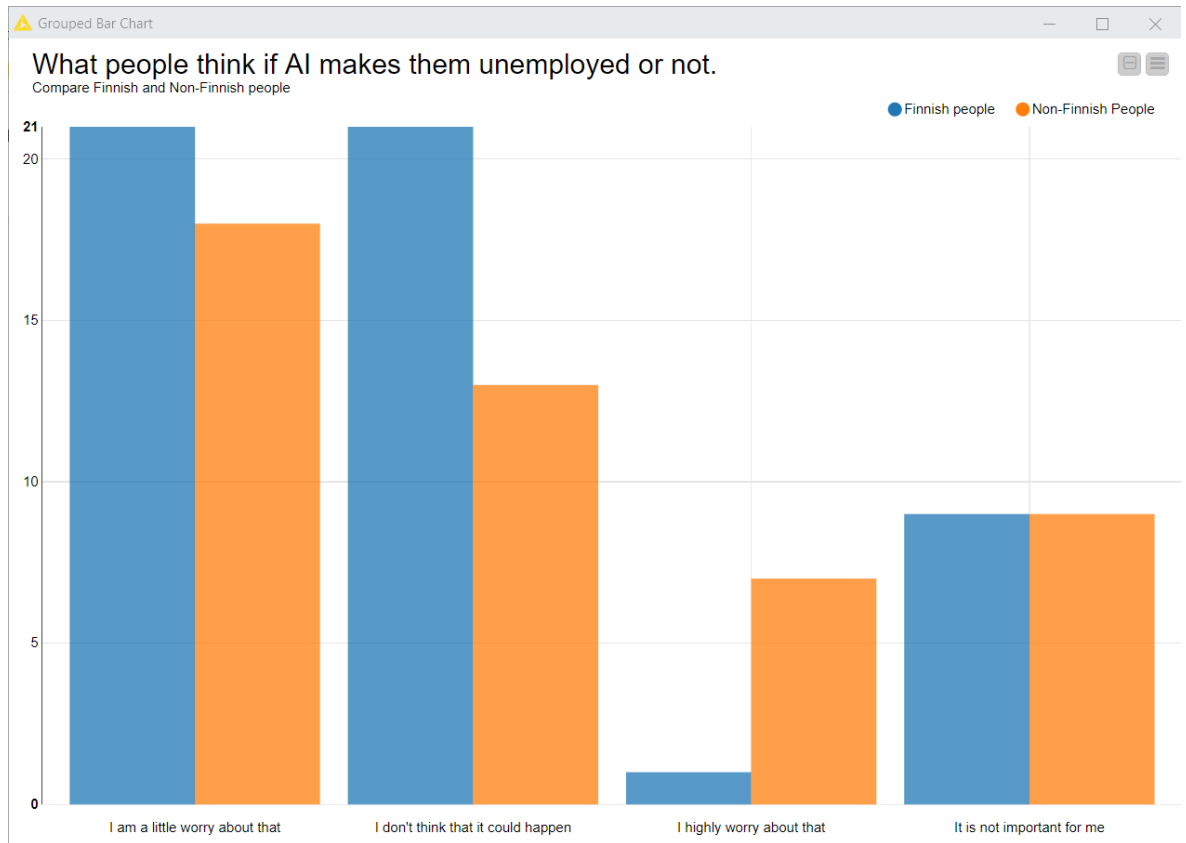


Figure 21. Could AI take people job from Finnish and Non-Finnish point of views

All other parts were also compared between these two groups, and the bar charts are added to the appendix as well. Later in the discussion part, we will discuss results and how it works for each group.

## 5 Implementation

After editing and finalizing the questions, we put them to the Google online form to create a link and ask people to answer the questions. We tried to decrease questions to a minimum in size but at the same time tried to ask all the questions which we wanted to ask. Finally, we had 14 questions in which the first four questions were about people's demography detail like age slice, gender, education, and nationality.

After creating a link in Google forms, we shared the link with a very short description, to the different platforms like Facebook, WhatsApp, LinkedIn, and e-mail. In a short description, we explained that it is one part of a master thesis about AI technology and kindly asked people to take a few minutes of their time and answer the questions.

Three of my close friends and I timed how long it took to answer the survey, and it took about 7 minutes in average. If someone wants to add more comments or text, it could take 10 minutes for one person to answer all the questions.

In addition to my ways of sharing the link, my supervisor Dr. Amir Dirin also shared the link in his own LinkedIn page and also with students in classes. Since the target was all types of people, I also shared it with people in my country like Iran and Azerbaijan as well. We hoped to get more responses to analyze, but from my previous experiences, nowadays people are busy with different types of duties and they don't have time for such surveys.

All 14 questions are mandatory, and it was necessary for responders to answer all questions to submit the form. Only the description part of question 7 which was asking about the reason why he/she chose that answer wasn't mandatory and some of the responders didn't answer the reason for the chosen option. But still, all of them chose one of the options and 73 of them wrote the reason. Because this part is only additional textuality content about the question, it will not affect the whole analyzing process.

### **5.1 Processing the data**

For implementing and analyzing data in this survey, we used the KNIME platform. KNIME has a wide range of nodes to clear and manipulate data to get good results. We downloaded data from Google form as an Excel file and imported it to the KNIME to work with it. Because our questions and chosen parts were clear enough, we didn't have big challenges to analyze the data.

In KNIME we created different workflows for different types of analyses and questions. All works were saved for future editing and each of them started from the beginning. In some multioperation cases, it could be created Metanode to use in different workflows, but because our data wasn't big data in size and rows, we didn't choose this way to analyze. In the case of needed multioperation in data, we could create different metanodes for each operation and then input connections to the package of nodes that we created for each operation. Metanodes include a series of nodes all together to operate. In working flows, we don't need to create all those nodes for the specific operation and we could use metanode behalf of all those series. We could create different metanodes for different operations and use those in any places we need. The figure below shows a metanode which two operation lines in left flow work doing the same action and have the same result in the end. The only difference is that we normally do it in the first line but in the second

line, we used metanode which added nodes in it. The Metanode inside nodes shown in the right part of the figure below.

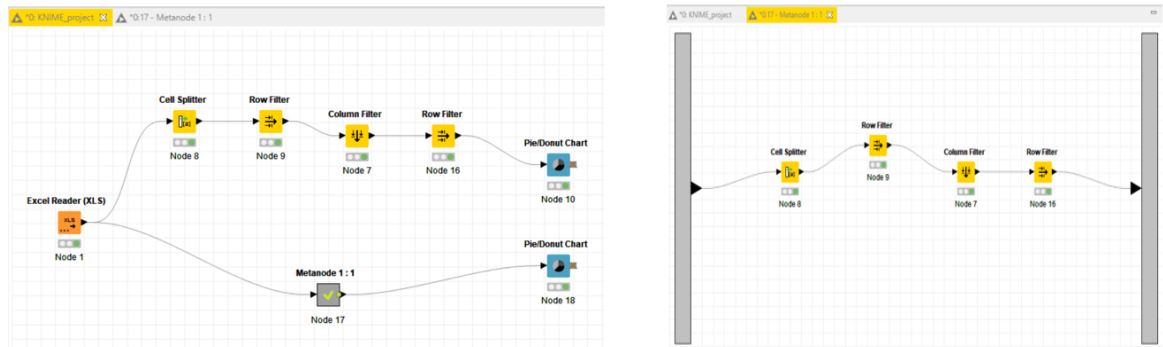


Figure 22. Metanode sample

Almost all workflows ended with graphics and charts or tables to better view and understand. Charts in the KNIME platform are dynamic with different colors and actions when hovering over it.

In this analysis we filtered results in different groups such in general, by gender, by Finnish and Non-Finnish people, by highly educated people, and compared between Finnish and Non-Finnish people.

## 6 Result

From our survey, the majority of people know that they are already using AI technology in their life which 53% could say where they use it but 40% don't know the exact places in which they use AI. 6% of participants believe that AI technology does not exist yet.

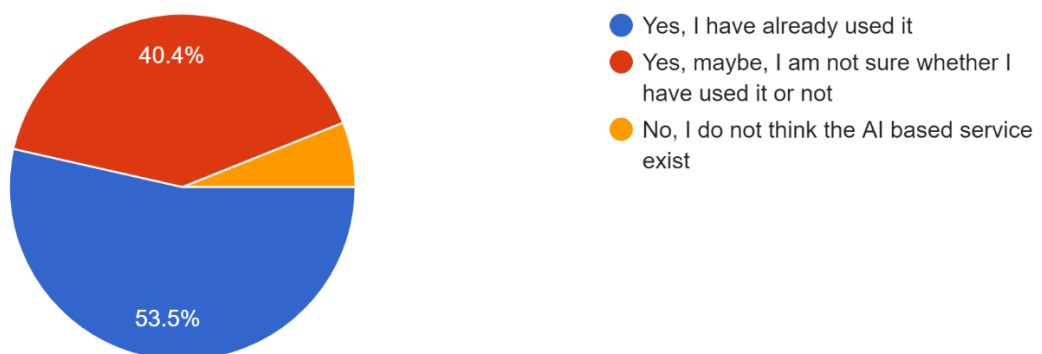


Figure 23. Do people used AI or not?



Also, most of the people as 72% of participants believe that AI helps humanity and 5% believe that it is not helping. The rest of them, leaving 23% of participants, don't know if it helps or not.

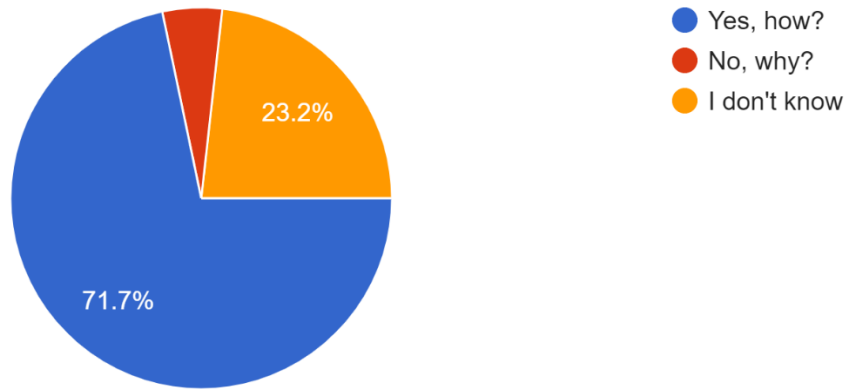


Figure 24. Do AI help humanity or not?

Because the reason explanation of this question in the survey wasn't mandatory, some of the participants didn't answer for this part. In total 78 people from 99 answered their own opinion as text and from those numbers only 4 feedbacks related to No answer in options about AI. The table below shows those 4 feedbacks related to reason why they chose the No answer, and all of the other answers are added to the appendix to be read.

JavaScript Table View

Show 10 entries Search:

RowID	Col7	Col8
Row1	No, why?	AI brings more and more technology in our lives, which may sometimes put a distance in between people and their lives.
Row4	No, why?	In what sense?
Row17	No, why?	Humanity can not be processed by machines, it is a gift from God
Row36	No, why?	There is a possibility that it may end the human race altogether as AI will replace humans in their own jobs.

Showing 1 to 4 of 4 entries

Previous 1 Next

Figure 25. Negative feedbacks about AI in our survey

One of the questions was about what people expects from AI technology. It was a required question and all of the participants answered it. This question is a multiple choice question, which means they have a chance to choose more than one option. Most of the participants chose the option Helps humanity in different fields and makes our lives easier, and the percentage is 74% and 72% of all chosen. Because this question was multiple choice, even all options could have a percentage from 0 to 100 percent. The bar chart

below shows the results all together with percentages. 4% of participants didn't find the right answer from our options and chose the "none of them" option.

8) What are you expecting on AI technology? (Multiple choices)

99 responses

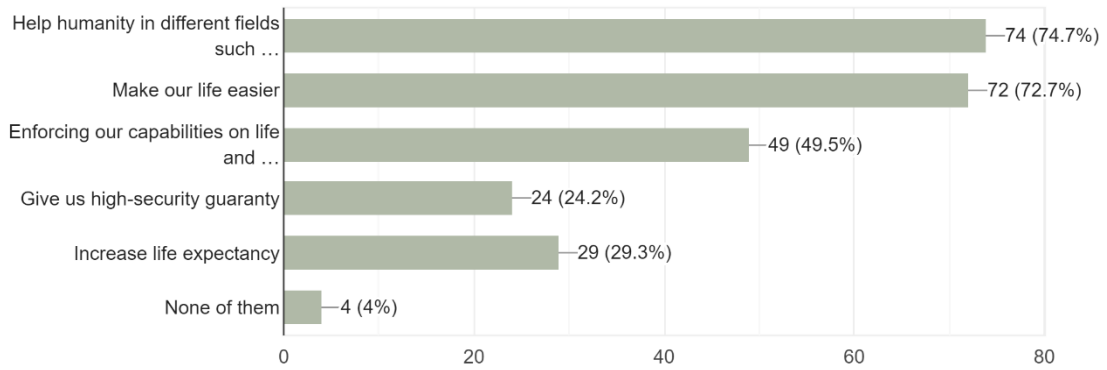


Figure 26. Participants expectation on AI technology

One of the major problems which people worry about is losing their jobs after AI technology. Because of that, we put this issue as one of our questions to know and see how people think about the job issue. Do they worry about it or not? As a result, 8% of participants are highly worried about it and 40% of them are a little worried about this issue. Losing their job because of AI is not important for 18% of people who participated in this survey and 34% of them are relaxed about it and they don't believe that it could happen. In general, altogether, 48% worry about it and 52% don't mind about it. One mentionable thing here was the very low percentage of those people who are highly worried about this kind of losing their job.

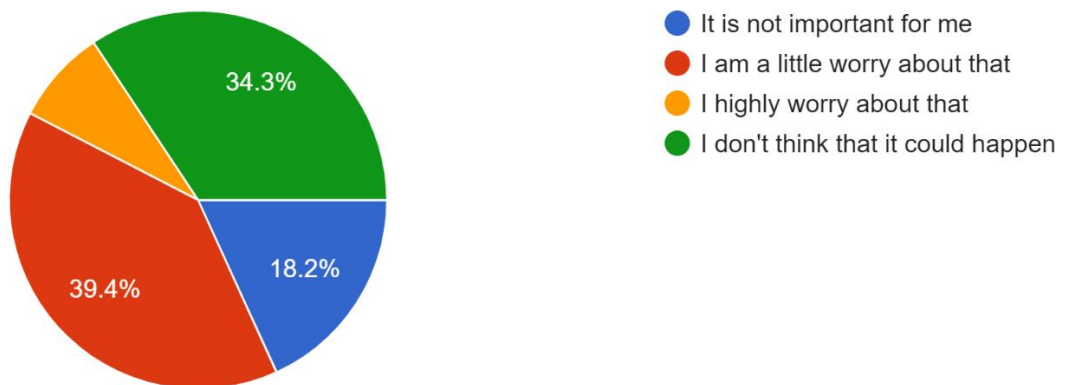


Figure 27. Do AI makes people unemployed?

The majority of people in this survey accepted AI roles in different fields. Only 9% of participants believe that humans created AI and it cannot be compared with a human. This means that people and humanity will have full control over AI all the time. But the rest of the people believe that AI will reach too many fields in the future. Someone believes with some limitation and someone else thinks without any limitation. 39% think AI will reach all fields, 15% think it will take the majority of people's duties, and 36% believe that it will take some part and some fields of human works.

From the next question, 98% of people in this survey support the development of AI such as AI for AI or other kinds of development. Some of the people in this percentage accept it without any limitation and some else with limitations or development in special fields. Only 2% of the people believe that AI is developed enough, and we have to stop any kind of development for it. One option in this question was about going back to the world without AI. No one marked this option, so that means 0% of people think about this situation. Image below show these results in chart view.

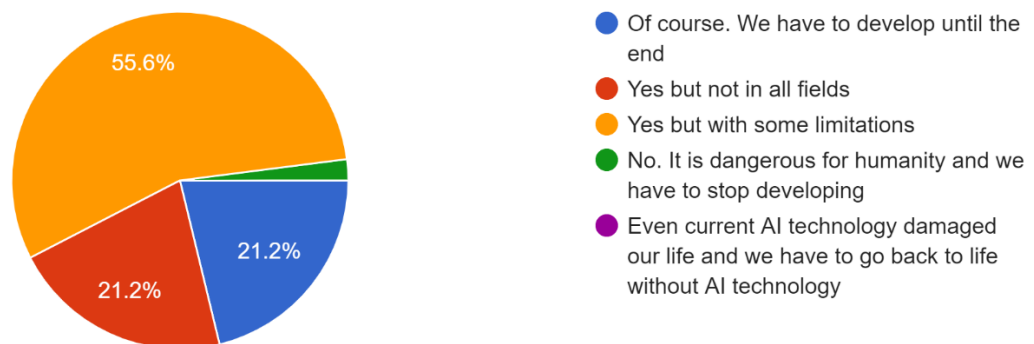


Figure 28. Do people support AI development or not

One of our interesting questions to know about machines and AI technology was about AI ability to act the same as a human in different cases especially in a crisis, management and issues related to morality and humanity that are very difficult for coding and programming. Here in this survey, we are interested to know participants' points of view about this kind of development for machines and AI technology. 48% of people believe that developed AI could take responsibility for all fields and even moral issues and the rest 52% believe that some parts of roles highly depend on human capabilities and AI will fail to reach those points.

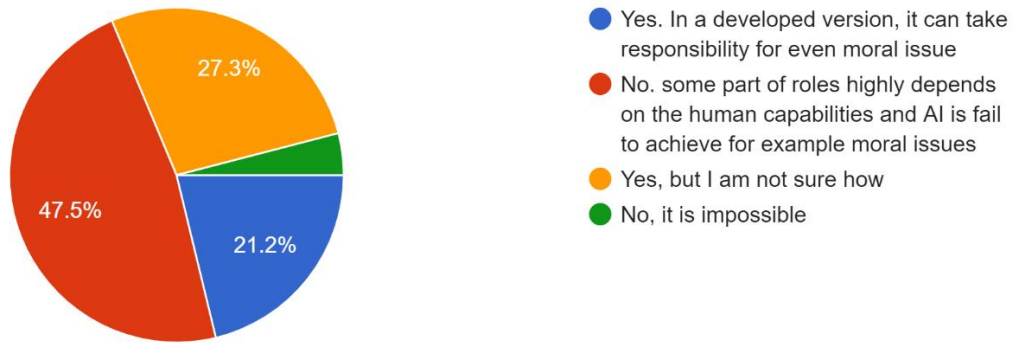


Figure 29. Can AI take roles which have been specific to human race?

In a very developed version of AI technology, machines need to develop and repair itself without human action. At least it is one of the scenarios which could happen in a developed version. About 47% of our participants believe that it could happen in a developed version and 19% of them believes that it is impossible, and machines could not develop itself without the human brain and hand. The rest of the people in this survey were not sure about the answer and direction of the AI developed version.

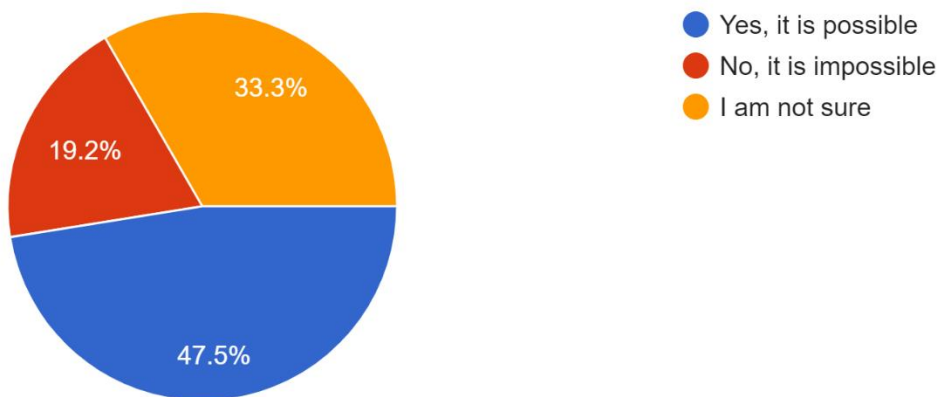


Figure 30. Could AI develop itself without human support?

The last question was about how they see AI in ten years. 68% of participants see it as part of normal life which helps people in different fields, and 22% of the people see it with no significant change and people still control everything. Besides these people, 11% of the participants believe that machines and AI will take all control from human hands. It is mentionable that almost 70% of people think that it helps humanity and eases our life.

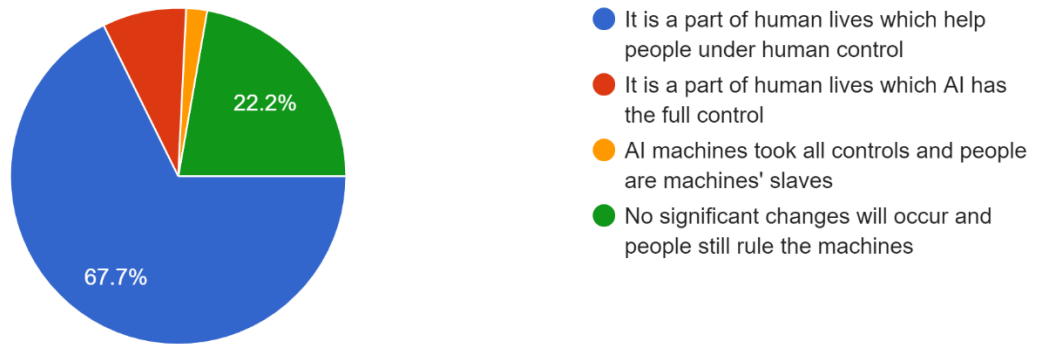


Figure 31. How people see AI technology 10 years later?

## 6.1 KNIME workflow

Here in this part, we will shortly check the same questions for only Finnish people. What we wrote before was the result of all the participants. In this part via KNIME workflow, we will filter out Non-Finnish people to see what Finnish people think about the different questions.

As shown in the workflow below, for the aim after reading the data via Excel Reader node, we used a Cell Splitter node to separate people who have a dual citizenship or nationality. Then, via the Column Filter node, we removed unnecessary columns like text columns and then via the Row Filter node, we removed all non-Finnish rows. 12 people in this survey had dual nationalities, Finnish and another nationality. In this part of analyzing we concentrated on the Finnish side and put them to the only Finnish category and analyzed it in this part. We then finally connected the Parallel Coordinates Plot node and Pie Chart node to see the result of each question separately.

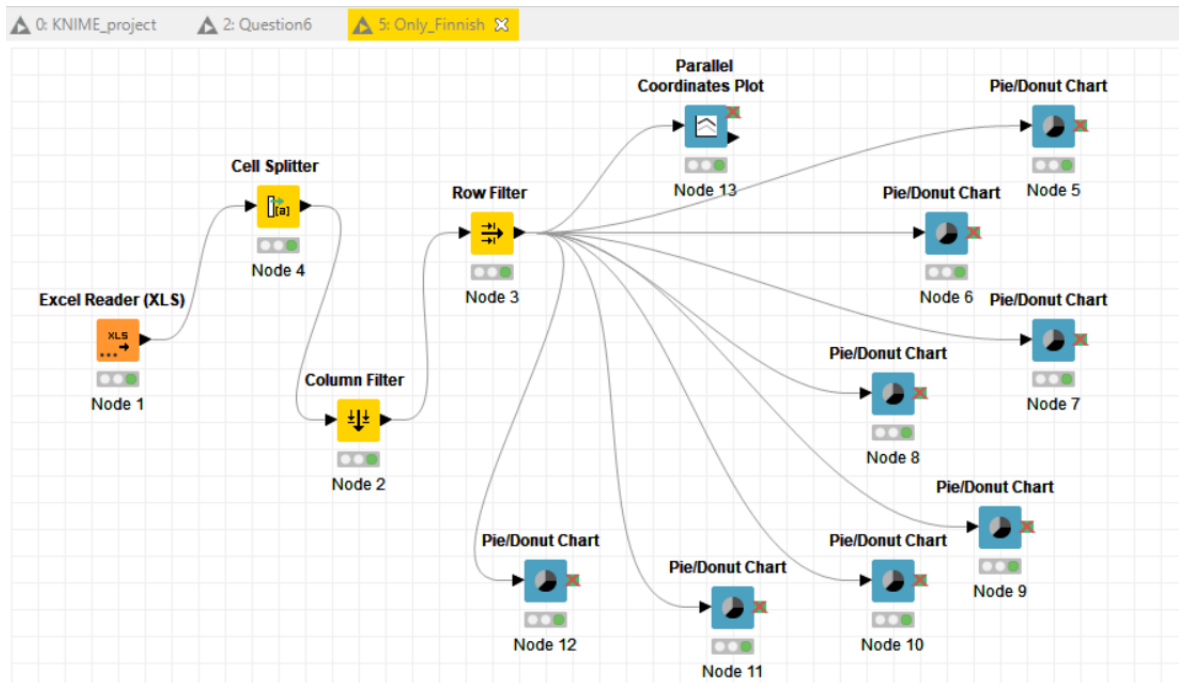


Figure 32. KNIME workflow to separate only Finnish people

Parallel Coordinates Plot node is a graphic view of all data in one place. In KNIME interactive view by clicking to one line, we can see all other answers to that parameter highlighted and we could compare it with all the other answers. In figure 33 one example of those connections are captured. In the KNIME dynamic view, it is more interesting to jump from one part to another and see all connections as a line chart. In this captured graph, we can see one female person with the age slice of 41 to 50 and with a high education point of view for each question.

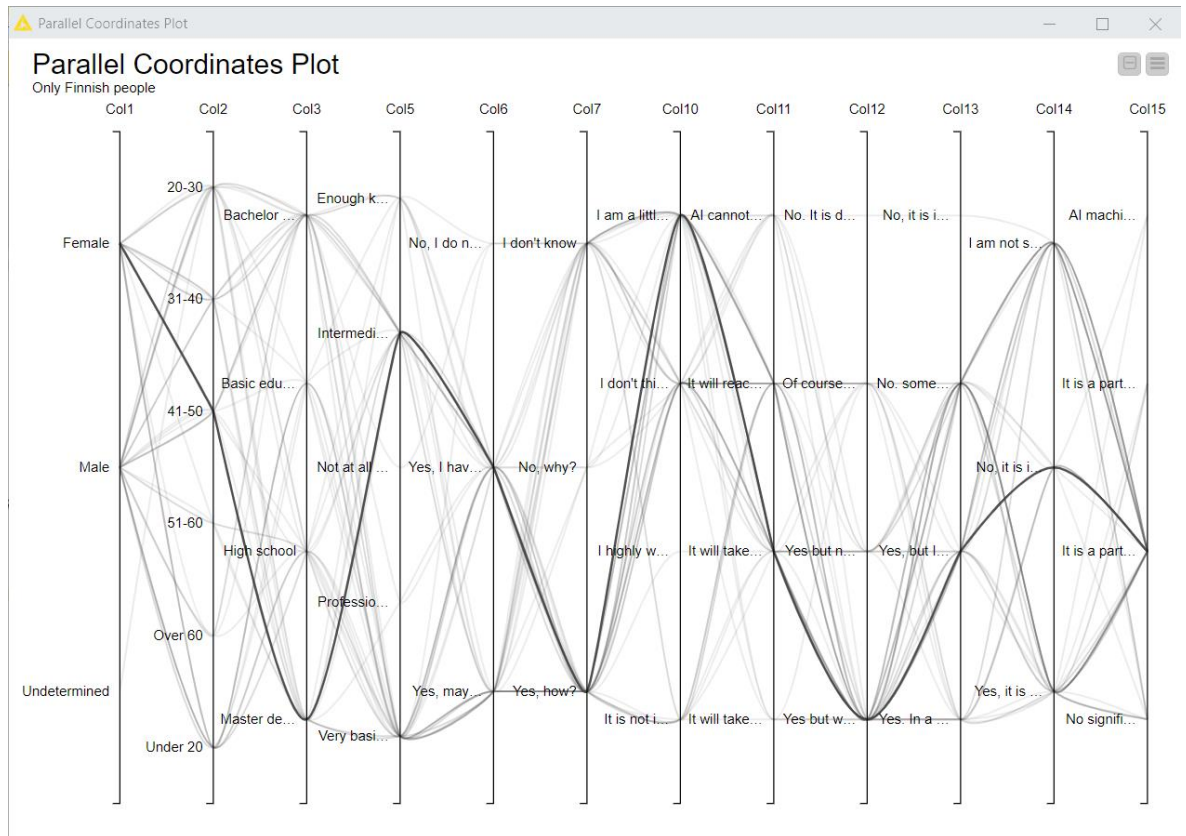


Figure 33. Parallel Coordinates Plot node result for Finnish people

About using AI based solutions, 52% of Fins say that they have already used AI based solutions. Additionally, to this percentage, 42% of Fins are not sure if they use it or not. Those people's answers start with Yes, but they are not sure if the technology they use belongs to AI. Only 6% of Finnish participants think that no AI solutions are being used at the moment. This shows that more than half of the Finnish people in this survey are already familiar with AI based solutions and are aware that they use it somewhere. The pie chart below shows the result from the KNIME analytics platform for Finnish people.

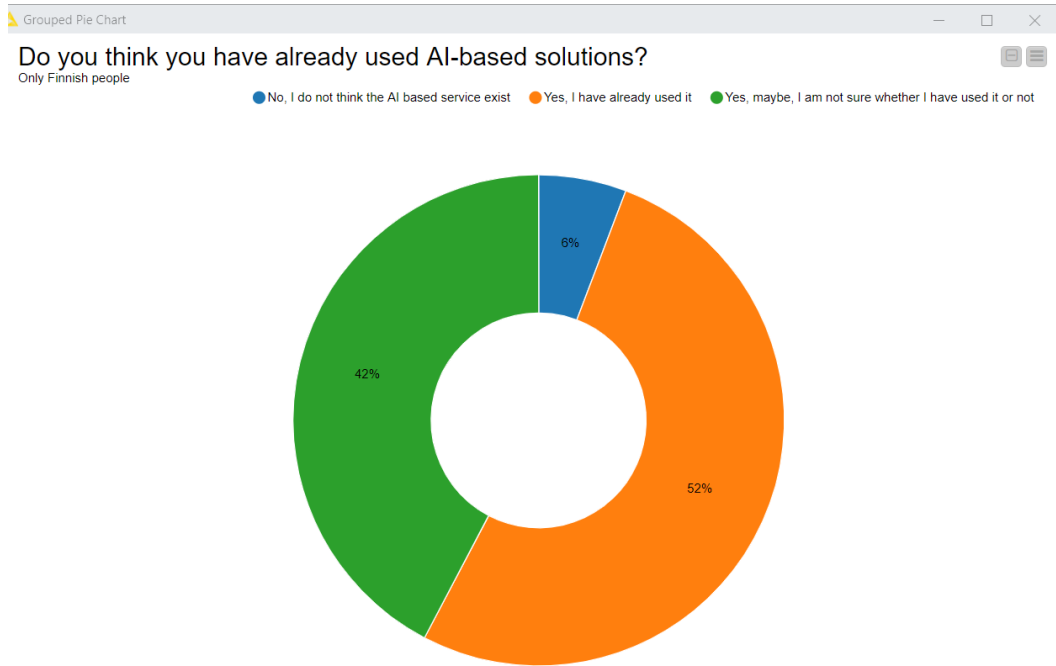


Figure 34. Finnish people view about already using AI based solution

58% of Finnish people believe that AI-based solutions help humanity and 35% are not sure. The rest of them, which is 8%, believe that it is not helping humanity, which simply shows that more than half of Finns believe that AI is helpful for humanity and the percentage of people who have a negative opinion about AI is a lot lower..

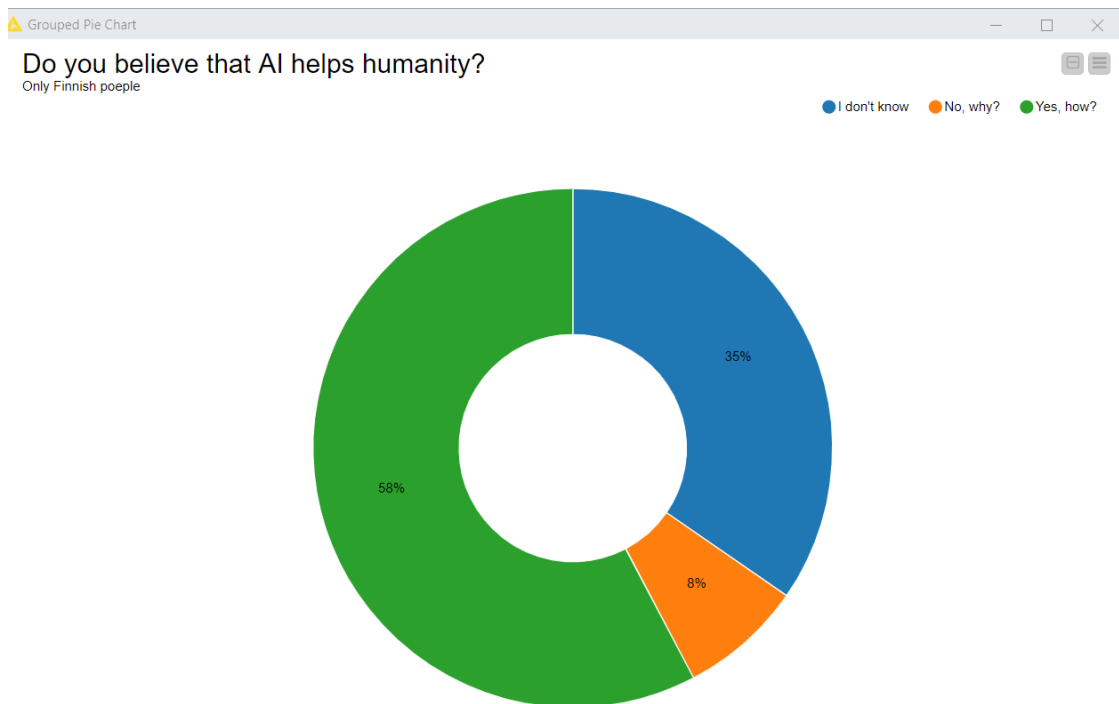


Figure 35. Do Finnish people believe that AI helps humanity?



From these two questions, we could see that Finnish people are already familiar with AI and they have a positive opinion about it and they believe that it helps humanity. The number of people who have a negative opinion about it and are not familiar with AI are less than 10% in both cases. The pie chart related to this question and the other questions are added to the appendix part at the end of this document to get a better view of each question.

About losing jobs because of AI technology, 40% of Finnish participants think that it will not happen and another 40% are a little worried about it 17% don't find it important, and only 3% are highly worried about it. This AI challenge has created one of the biggest forms of anxiety for people and from this result, we can see that it is not a large worry for Finnish people. In this case, they can accept new technology more easily than others who are worried about losing their jobs.

44% of Finnish people believe that AI will take over some parts of duties and people will have enough work to do, and 37% of them believe that it will reach all fields. 12% think that it will not compete with humans because it is created by humans, and the rest 8% believe that it will take the majority of human works.

About AI development, only 3% of Finnish people are against any development and none of the participants found AI harmful and have to go back to life without AI technology. The rest 97% accept and support AI development. 63% support it with some limitations, 19% support some fields and 15% of them believe that we have to develop until the very end. These results show that most of the Finnish people support developing AI technology, but they prefer to put some limits to AI power or AI fields. This could be very wise so that they are able to think about the limitations for the kind of technology they don't know the future of. They hope that machines and technology will be controlled by humans and they can be updated and developed under human control with limits.

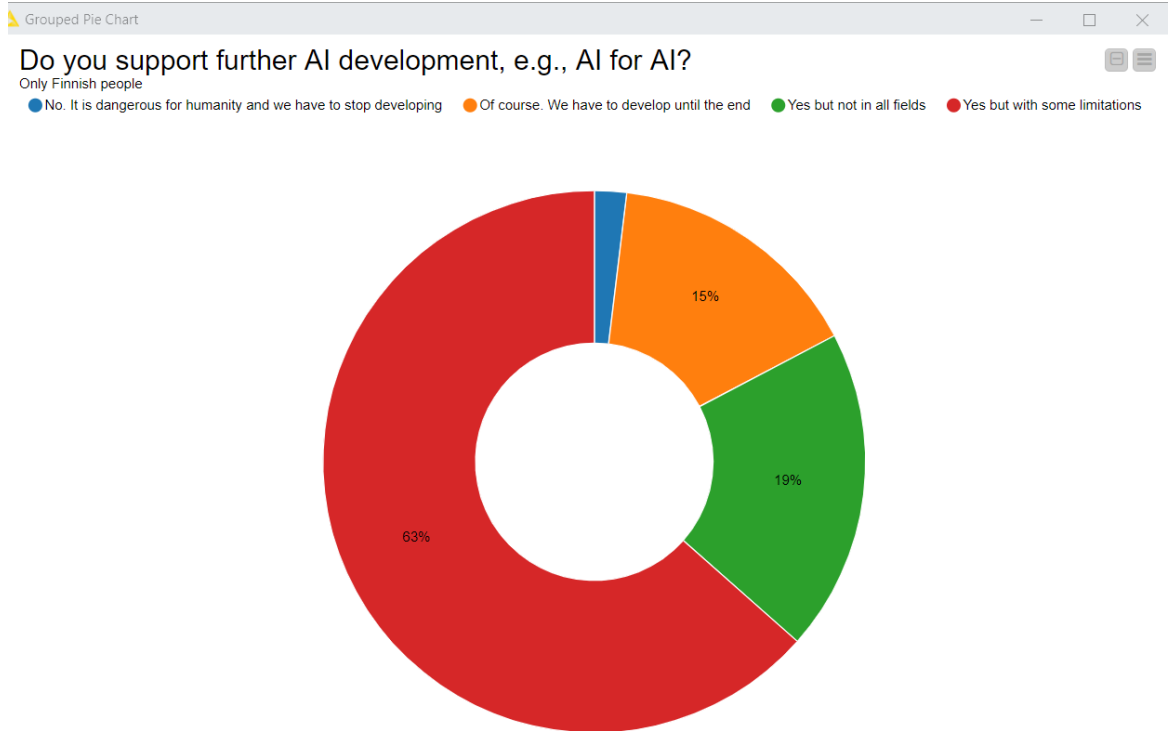


Figure 36. Do Finnish people support AI development?

52% of Finnish participants in this survey believe that AI can take a role in fields which are for humans at the moment. Like moral issues, crisis management and similar duties which machines cannot understand. 48% of people believe that it is not possible to reach that point and some roles highly depend on human capabilities and machines will fail to achieve those roles. The result for this was 48 against 52 for all participants, and 52 against 48 percent for only Finnish people.

For developing AI with AI itself without human support in the future, 46% of Finnish believe that it could be possible in the future, 15% disagree with this possibility, and 38% are not sure about it. From results, only 15% of people strongly said no, it is impossible. The rest of the Finns think it could happen or they are not sure about it.

Ten years later, 90% of people think to see AI technology helping humanity and humans and works beside them, and only 10% of people have a negative opinion about it and believe that machines will take control of everything. It is very important that 69% of the Finnish participants believe that it will help humanity under human control. This means they trust the direction AI technology is going towards and they have a positive view of it.

Later on, we did the same process with Iranian people. We included only Iranian people and the Finnish who also have an Iranian nationality. First, after reading data from the excel reader node, we separated rows by Row filter to Iranian and Finnish, Iranian rows

and then combined these two tables by the Concatenate node. We then filtered the text and missed value columns, and then used the result as input to different charts as Sunburst chart, Parallel Coordinates Plot, and Pie charts.

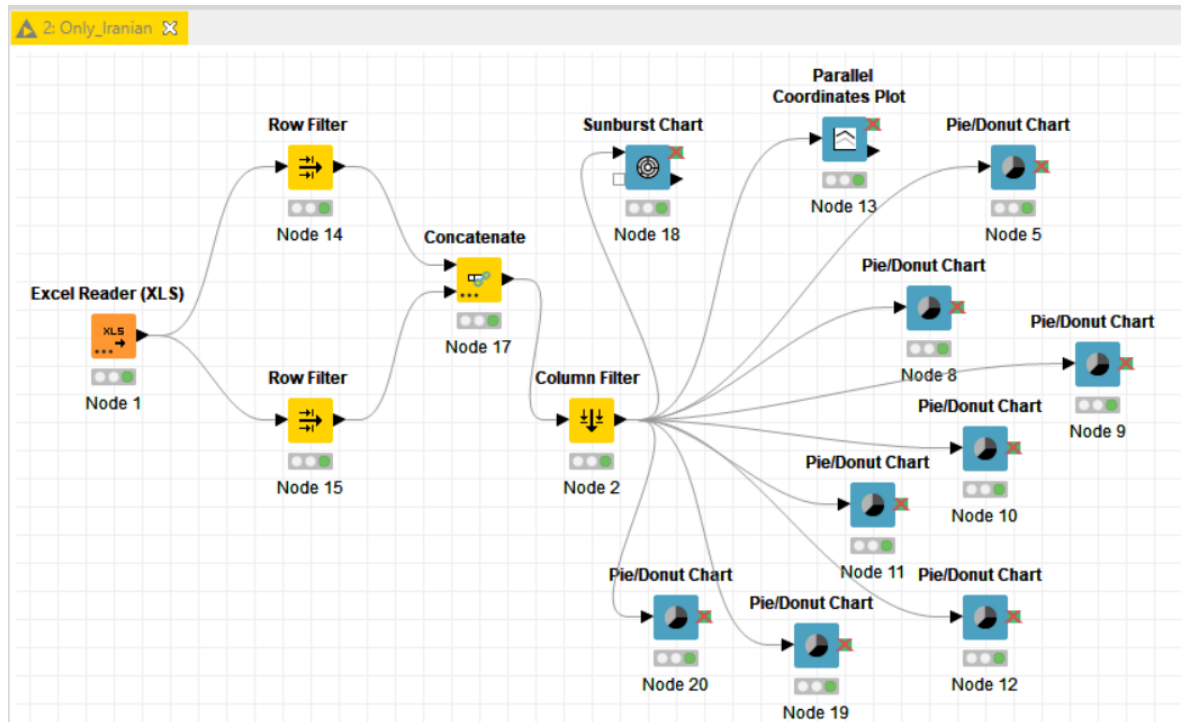


Figure 37. Work flow to show only Iranian people results

As a result of Iranian people in this survey, we got pie charts that are shown in the collected charts below. The extended charts are added to the appendix to be shown in its larger size. 50% of Iranian already use AI-based solutions, 44% of them are not sure if they use it or not, and 6% believe that they do not use it. 88% of Iranians think that AI helps humanity and 12% of them are not sure about it. None of the Iranians thought that AI was not helping people. 6% of Iranians are highly worried about jobs being taken by AI, and 31% of Iranians are a little worried about it. 37% of them believe that it could not happen, and the last 25% thought that it was not important.

Exactly half of Iranians believe that AI will impact all fields of our lives, and 25% of them think that it will take most of our works. 19% think it will take some parts of human works and that we will have many things to do, and the last 6% believe that AI could not compete with a human because humans created it. All Iranians support AI development like AI for AI. 31% of them support full development but 69% want development with

limitations in field and power. Nobody thinks that we have to stop the development and none of them found it as a threat for humanity.

Some jobs that include the understanding of moral issues and crisis management are highly dependent on humans at the moment, and 50% of Iranians in this survey believe that developed AI could not take a role in those works and the other 50% believe that it could do it in the future. About reaching a point where AI develops itself without human help, 25% of people believe that it will be possible, 31% think that it is impossible and the last 44% are not sure about it. For ten years later, 81% of Iranians in this survey thought that it will be one part of human life which will also help humans in their life, 13% of them think that nothing specific will happen and humans will still control machines and AI technology, whereas the last 6% believe that it will have full and absolute control of our lives.

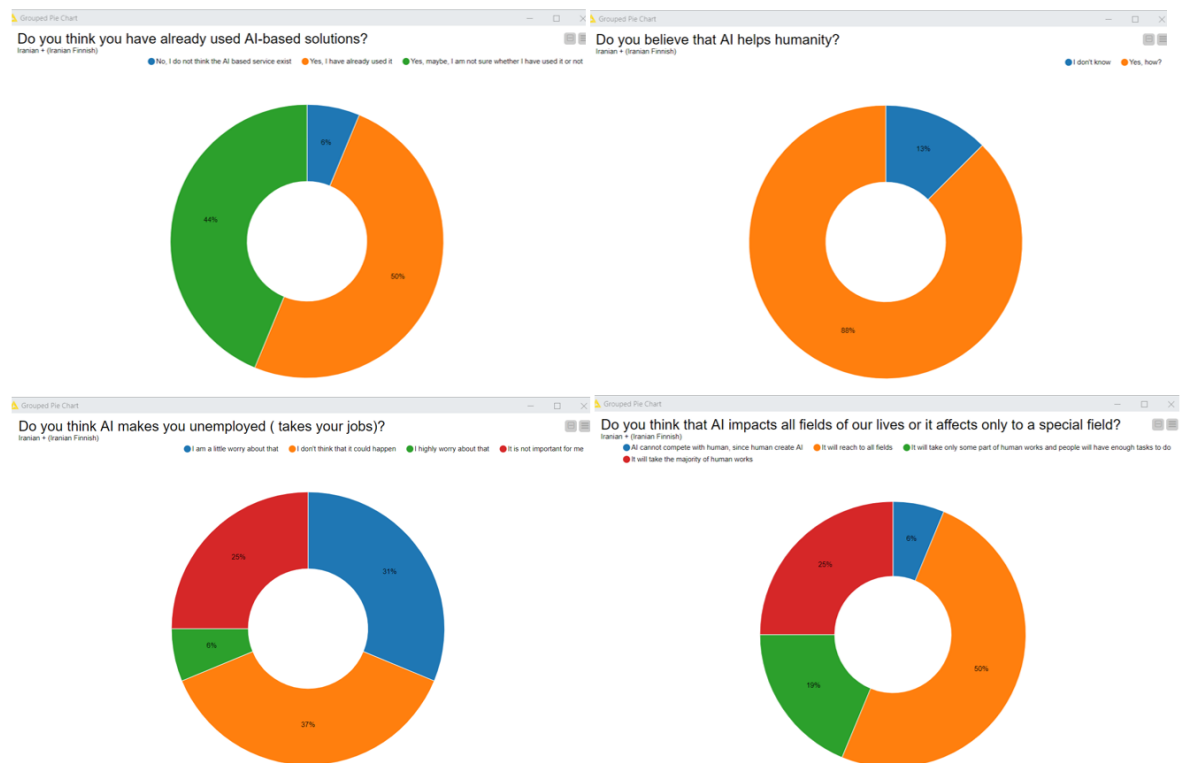


Figure 38. Collected Pie charts to show for only Iranian people

## 6.2 Decision Tree Prediction Model

There are many kinds of models in data mining such as Clustering, Neural Network, Decision tree, and other models. Here we will concentrate on the Decision tree prediction model and show the process of that in order to get a result.

Figure 39 shows the workflow of the Decision tree from KNIME data mining. After reading the data file with Excel Reader node and making some filters in Rows and columns, we used a partitioning node to divide the file into two different parts as learner and trainer parts. We divided the table as a 30-70 percent rule and separated it into two tables based on these percentages. Models in data mining in KNIME have separate Lerner and prediction nodes and here we used those as well. After the Decision tree predictor node, we used results for three different nodes as Scorer, Receiver Operating Characteristic Curve (ROC Curve) and Pie Chart to get different views of the data.

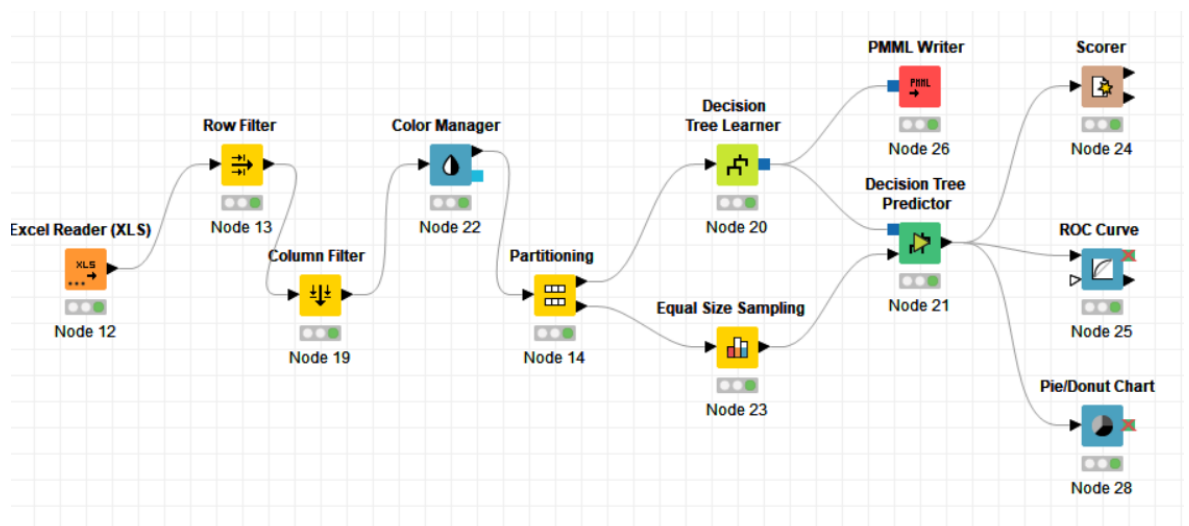


Figure 39. KNIME Decision Tree mining workflow

Figures 40 and 41 show the decision tree model of the data and how each part connects to another. The first figure shows widely what must be checked in the KNIME platform dynamically to open and see different clusters and wings by minus and plus symbols. Based on our chosen column, we can see the connection between all the parts with prediction results in each. For the question about developing AI by itself without a human action, 75% of people who have professional knowledge about AI, predict that it is possible and only 25% of them predict it is impossible. This percentage is higher in comparison with other groups that have lower knowledge about AI.

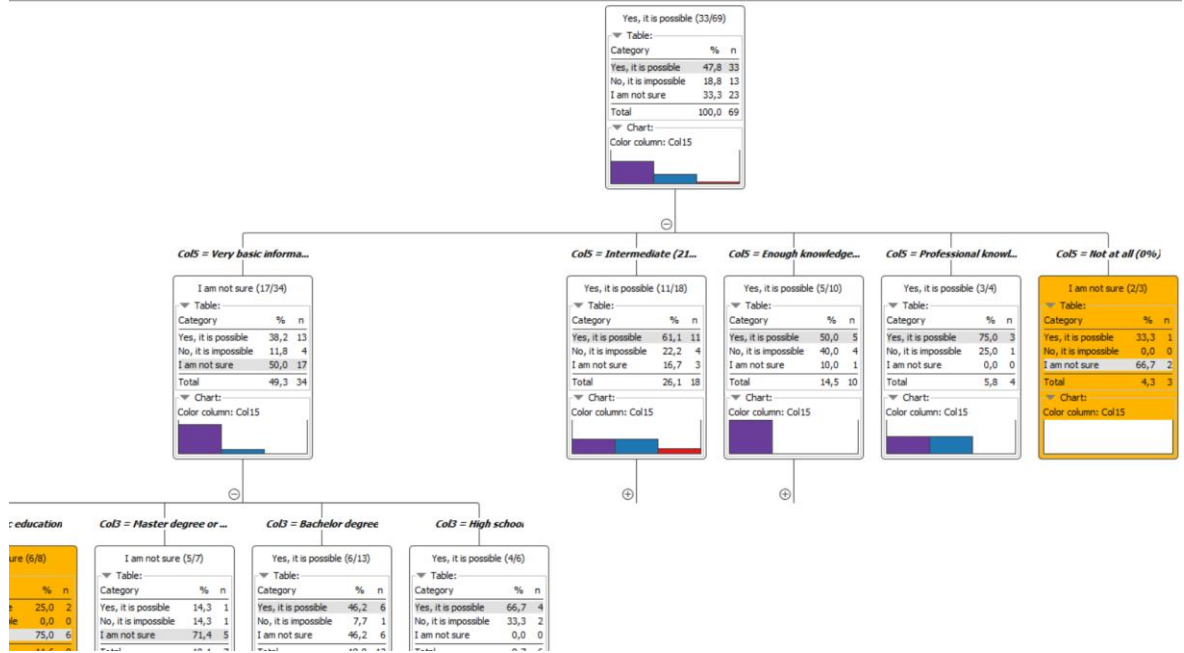


Figure 40. Decision Tree predictive view

Figure 40 also is the same decision tree but in simple views.

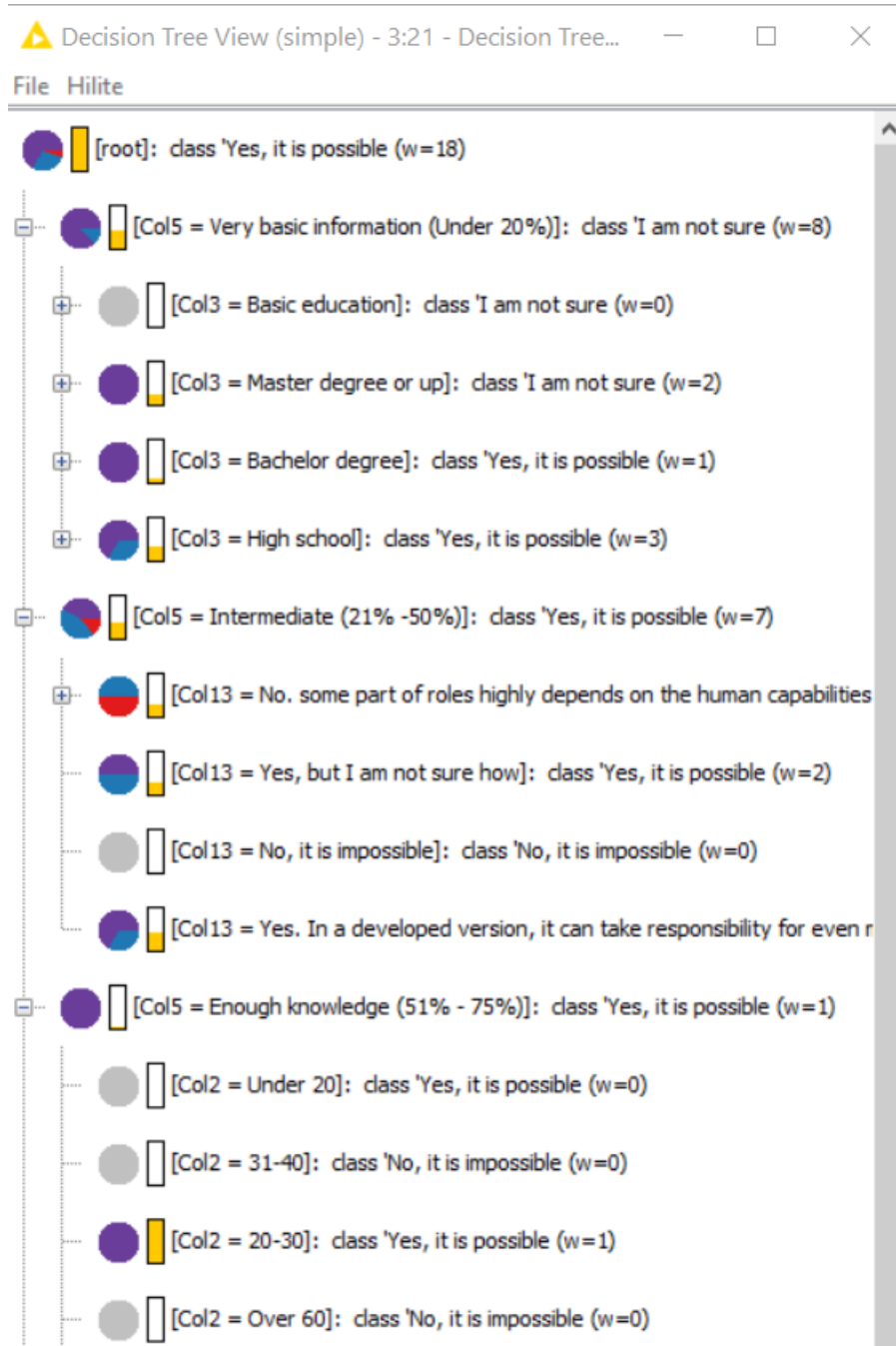


Figure 41. Decision Tree predictive simple view

Figure 42 shows the ROC Curve of the question about AI helping or not helping humanity. The curve starts from zero to one, and the x-axis is False Positive Rate with the y-axis being the True Positive Rate. The black line is a random line and our prediction result is in true positive rate with the probability of 1.

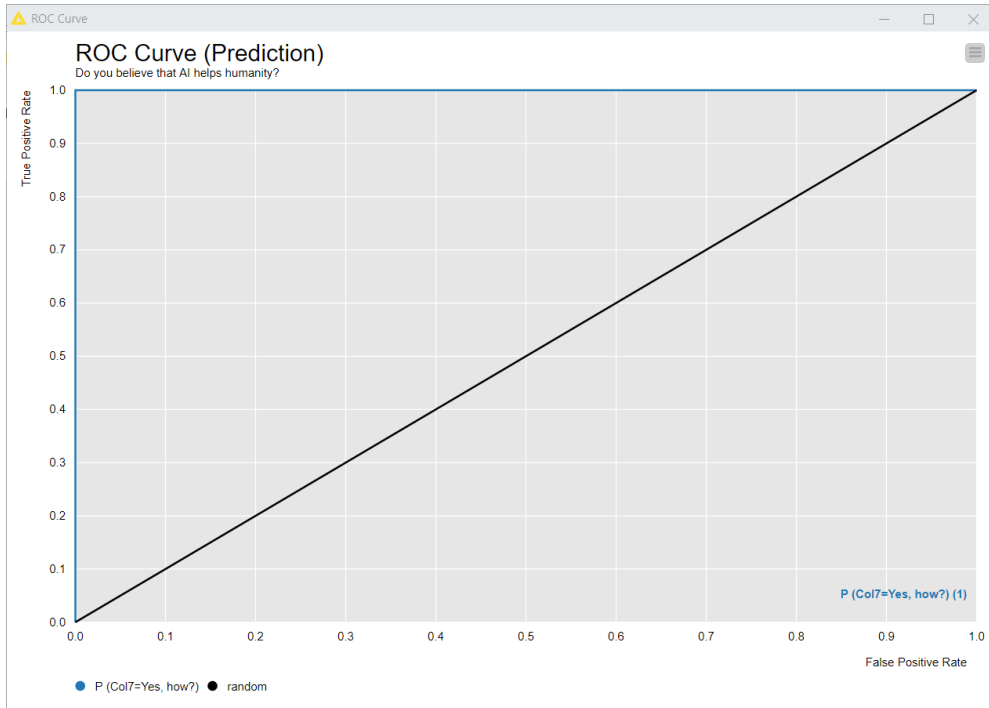


Figure 42. KNIME prediction ROC Curve on helping AI to humanity or not.

The prediction for this model is in a perfect situation because the Area Under Curve (AUC) is here, which means the model for the Yes answer here is going up from True Positive Rate until one.

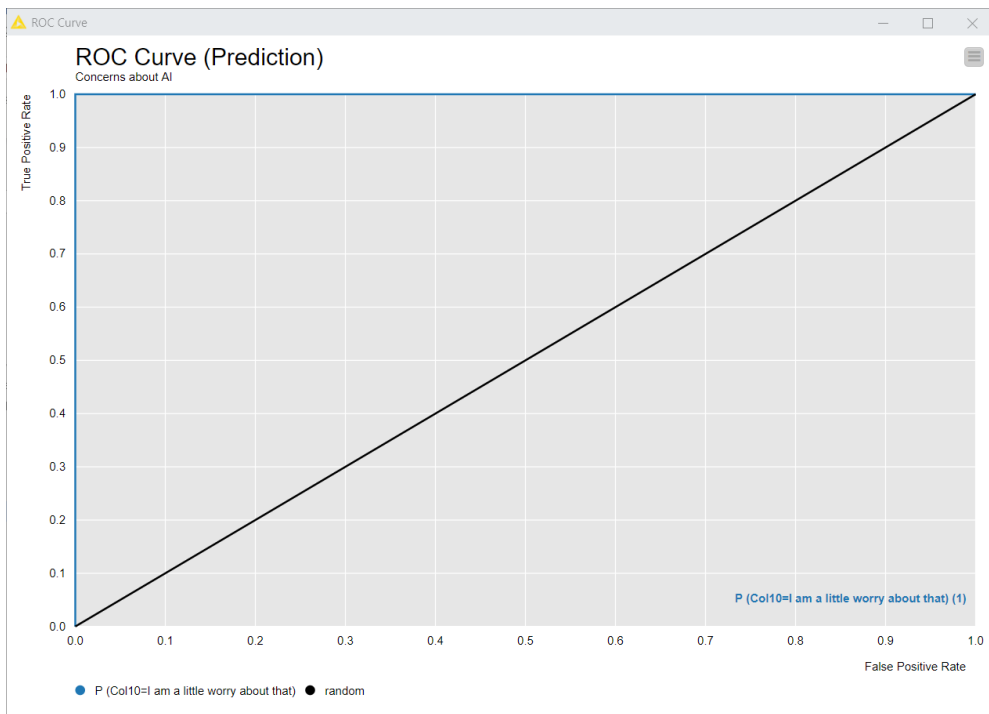


Figure 43. KNIME prediction ROC curve about AI concerns.



Figure 43 also shows the ROC curve about the prediction of people's concerns. As shown in the graph, this model is in a perfect situation as well which AUC is one. The curve shows that people are a little worried about AI in the future, and because of that people generally spoke about limitation to AI to be sure that it is in people's control. The True Positive Rate in this curve rises from zero to one without any False Positive Rate.

## 7 Discussion

From traffic showing on the map to self-driven cars, Artificial Intelligence makes things fast and in a safe mode. It is in safe mode because it could collect thousands of data around us and based on that data alert and protect our activity. It makes us save our time to do the same thing in a very short time.

Artificial Intelligence today is a weak version of AI and it has not covered all places and fields at the moment but the long-term goal of researchers to create a strong format of AI could reach more fields with more abilities (Tegmark Max, 2016).

There are some concerns and worries about AI, where some of them are real facts and some or not. But based on our survey and other research, the truth is that humans do indeed worry about almost everything they don't have full control of and where it goes. Dr. Vivian Chan, Founder and CEO of Sparrho, a company that uses augmented intelligence, said AI is still very much a mystery. "We don't necessarily know how the algorithms are classified and how they determine outputs. People want to understand how the decisions are made," she said (Fourtané Susan, 2019). This concern shows itself in our survey as well. In different filters as educated people, only Finnish people, and only Iranian people, we could see almost the same concern in all groups. Looking back at figure 21, the worry in Finnish people is a little less than other nations in comparison. For example, 3% of Finnish people are highly worried about AI, aligned with 6% of Iranian and 8% in general. This could maybe be because Finland is more familiar with technology and they use it in everywhere since their childhood. At the moment Finnish primary schools are using technology and computer from the very first years and it could make them more comfortable with new technologies.

One of the basic issues we must mention is that AI technology is in the developing process at the moment and the developing process will depend on human decisions of

how and in which direction they will develop it. From this survey, we can see that about 78% of people have basic and intermediate knowledge about AI and it could affect the right decision about the future. Of course, people don't need to be professional in AI but they need to have more knowledge to make decisions or force to politicians to make the right decisions (Rautio Pekka and Vis-ala Aku, 2018). AI development and policies based on human decisions and given direction. At this point, the human could organize it and put some limitation which controls it all the time. Scientists are working hard in different fields of AI and all limitations depend on the decision we make.

Some of the machine decisions will be related to the culture of that country and it could change from culture to culture. AI technology could collect all kinds of data from different cultures and countries and act based on that. It is one famous example of self-driven cars which they don't have a human driver. If one case of an accident happens for that car, and the car has to decide that what have to do. The major question for the human is that, could machine decide based on morality and save people in an accident case or it will just decide to save itself and not people around it. From the scientist's point of view, people research cases in different cultures and from millions of collected results in surveys and research they could understand the priority in each country. In this document, for example, people from Germany prefer to accept a decision made by machine but in France, children and women have more priority than men to be saved (Colson Eric, 2019).

### **7.1 *What people think about AI?***

People in this survey have very different views and opinions about AI. As shown in figures 22 and 23, the majority of people used this technology and they are familiar with it. And also, the same majority finding it as useful for humanity. They believe that AI will be one part of human life and it is useful for humanity. Based on the results, only a very small percentage of participants are highly worried about job issues in the future. The rest of the people do not have a big problem with it, and they believe machines make human work easier and they don't have reason to worry about it. People also think that AI will reach and could take the majority of the work which humans doing at the moment and they don't have a problem with that. They need only some limitations in power and fields which will be effective.

In another research made by Pew Research Center in 2018, people had almost the same concerns about AI. As shown in the list below people are worried about humanity, private

data, job loss, independency, and mayhem (Anderson Janna and Rainie Lee, 2018). These concerns are more or less the same for most people nowadays.

List of concerns from Pew Research Center about Artificial Intelligence and the Future of Humans:

- Human agency: Individuals are experiencing a loss of control over their lives
- Data abuse: Data use and surveillance in complex systems is designed for profit or for exercising power
- Job loss: The AI takeover of jobs will widen economic divides, leading to social upheaval
- Dependence lock-in: Reduction of individuals' cognitive, social and survival skills
- Mayhem: Autonomous weapons, cybercrime and weaponized information

Concerns about AI's future are real and AI developers have to mention deeply about those. As discussed early, developers have full control over AI the moment and they could act on the process as they wish. Later could be so late to fix.

One of the questions in our survey had free text writing possibility and, in that part, participants wrote comments and feedback about related question. Only four feedbacks were related to No answer about helping AI to humanity or not and all other was positive or advisable.

Based on comments, participants in this survey believe that AI could calculate thousands of complex data in a very short time and give a certain result that humans could not be that exact. AI technology makes life very fast and easy to live. Especially in the health care field people are thankful for AI to recognize and solve many problems related to health care. For example, "This new technology could easily and in a very fast way based on some pictures, recognize cancer in the human body at the very beginning level". AI reduces human errors to a minimum in recognizing the problem and find a way to act to solve the problem. "The human brain is limited in processing data and information in a certain moment, but AI could process the huge number of data in seconds or maybe in minutes". For example, in recognizing cancer case, AI downloads and analyze thousands of positive and negative cancer cases and could find small differences between positive and negative cases. When people showing a new picture to the application, the application immediately could compare all areas with the real cases to find any positive points to cancer. If all parts look good without any symptoms, it could give negative for

cancer as a result. this process is really hard or in some cases impossible for the human brain, but machines based on AI could do it in seconds or minutes.

“The AI working, and processing data is almost unique, and they are acting the same way as others. But human doing the same thing in different ways which in many cases are complicated”. For example, when one programmer coding a program, s/he uses own way to code software and sometimes it is not easy to second programmer to understand previous one to complete or edit. This happens in those cases which both programmers wrote codes in the same language. If we speak different languages, misunderstanding will be huge and sometimes impossible to solve.

One of the other fields which AI is very useful and could give very fast and reliable information is prediction the next level and future. Based on AI technology we could easily know what could happen in the future if we go the same way. This is very important especially for those people who analyze data. They could see data related to the future and prevent any unwanted cases. As one of the responders in the survey mentioned: “In 10 years the increase of processing power will allow slightly more advanced AI algorithms, but more so the processing of larger amounts of data that will increase the accuracy of predictions created by them”. AI has a very big role in analyzing data especially big data which we have a very huge amount of data and increase those data every second. Organizing those amounts of data which nowadays each of us creating in every hours and minutes, is a very big and countable job which AI do.

## **7.2 What people expect from AI?**

AI's last aim or last point of reaching is unclear for many people at the moment. Based on figure 27, people are a little worry about the future of AI and the last destination but on the other hand, as shown in figure 24, they see how it help humanity in the different field especially in health care issues. The majority of people believe that it helps humanity.

Pew Research Center also has the similar concerns about AI's aim and last point. The experts predicted networked artificial intelligence will amplify human effectiveness but also threaten human autonomy, agency, and capabilities (Anderson Janna and Rainie Lee, 2018). Most experts, regardless of whether they are optimistic or not, expressed concerns about the long-term impact of these new tools on the essential elements of being human (Anderson Janna and Rainie Lee, 2018).

In our survey concerns about AI in all categories like general, High educated people, Finnish and Iranian are less than 50 percent. But still, in the comparison between these groups, all people together are more worried about AI's future than other groups. And high educated people and Finnish people are more worried than Iranian. Figure 8 from Max Tegmark shows as well that many top AI researchers are concerned about AI's future. Erik Brynjolfsson says that "We need to work aggressively to make sure technology matches our values" (Anderson Janna and Rainie Lee, 2018).

Main thing people are worried about AI's future besides unlimited benefits, is terrible scenarios about it. For example, we heard and seen many horrible scenarios in which robots and machines take control of our life and machines will not understand humans at all. For example, nowadays we see robots look like human and they act like a human. They also could show feelings like happiness, smile, anger, and many other senses like a human. Robot Sophia is one of them which created in high ability.

We are carrying many reactions and habits in our DNA which we didn't learn it from somewhere (Treffert Darold, 2015). Those behaviors made inside people within thousands of years and step by step. These habits made our humanity and we more or less believe that machines can not take a role in this part of life and in machine authority we will lose humanity at all and machines make us slaves for themselves. Because of those reasons, people are a little worried about AI's future and at the same time, they don't want to go away from the benefits of AI.

Based on figures 24 and 26 we see that majority of people see AI as a technology which helps humanity and based on feedback related to this question, they want AI as assistance for the human to help in different fields. Especially heavy jobs or some risky jobs like fire station jobs could do by robots programmed by AI technology. Again, based on participants' comments, people don't like to see AI and robots as a competitor with humans and expect it as a technology that helps humans.

Figure 26 shows that the second big expectation which is almost the same level as the first one is, AI making people's life easier. AI could do many things easier than humans and people are happy with that. It is many jobs which are not hard for people or it is not unsolvable for human, but AI could do in a very fast way and make people's jobs easier.

One of the other expectations of AI technology which we get from figure 26, is Enforcing people's capabilities in life and work. We as human have many limitations in capability in many things like recognizing things in a big amount of information. For example, finding people with a high temperature in airports is very important for countries but it could make

much time to test all people one by one. It makes very serious problems like delaying flights and losing them. But AI technology could easily scan all bodies and alarm immediately for personnel if it finds someone with high temperature. We could give thousands of such examples that AI gives us the high capability to recognize and act in the right way.

Again, based on figure 26, only 29% of votes in this survey went to increase the life expectancy option in the questions. This means people don't expect so many such things from AI and they could find a solution in other places. They want AI as a helper in physical life and not in the psychological part of life because life expectancy is related to psychological issues and participants in this survey don't care about it at a high level. Actually, getting help from AI in the health sector or risky parts of life like recognizing serious problems, increase life expectancy already but people in the survey preferred to not vote that as much as others.

According to Gartner, AI security is a 2020 technology trend to watch (*Definition of AI Security*, 2019). AI also could give high-security guarantees for people and systems that people use. Especially in cyberattack cases, AI could be very useful and fast to find treats and act again. Based on the SANS Institute SOC survey, responders admitted to relying on time- and resource-intensive methods for threat hunting, which often results in alert fatigue. The consequences of which can be dire. For example, 73 percent reported a single alert investigation can take hours or even days and 53 percent said they use three or more data sources to get to the bottom of an investigation (*Definition of AI Security*, 2019).

Refer to figure 26, participants in this survey didn't prefer the security option so much and its percentage in options is the lowest one. Security to people's lives and security in systems and machines could understand wrongly. In my opinion, AI could be very useful in system security especially from cyber-attacks. Nowadays many things could be controlled by the Internet in a very fast way and the security of millions of data could be one of the biggest challenges in the world. The human brain could easily confuse between millions of codes and data and a system such as AI technology could take a role to protect our data and systems. Maybe people in this survey thought that having high security from AI technology, destroy our life privacy and based on that they didn't interested to mark this option. AI machines have a deep connection with each other and many apps or programs which working with AI could reach our private life which many people don't like that. For example, if we install such an application that shows dangerous activity in someplace, we have to give such permission to the application that could track our daily lives movement.

This application could share this information with the third-party application and so on. Many people don't like to be public in moving or visiting places.

Maybe could be more reliable if we divided this part into two different options as human itself security and the human system's security to separate from each other.

From feedbacks in this survey, people want and hope that AI technology continues under human control. They are afraid if someday AI could develop itself without human effect and that day humans will not be able to give the order to AI. Based on the comparison graph between Finnish and None-Finnish people, Finnish people support AI development even by AI itself but they want this issue with more limitations than None-Finnish people. This shows that Finnish people are more sensitive about AI role limitations than other nations in this survey. They want to be sure that AI technology and machines always have such weak points that humans can take those in hand. Like as one of the participants mentioned, emergency shut down power in case of AI going in the wrong direction. The percentage of people who do not support further AI development is very low (less than 4 percent) in all groups and for Iranian groups that it is zero.

From feedbacks of participants in the survey, one of the sectors which people want from AI, are those places and jobs in a harsh environment and dangerous situation. Those kinds of jobs make life risk for humans and robots with AI technology could do those works in safe mode.

### **7.3 *How realistic is the expectation?***

Artificial Intelligence doesn't have a magical power to do what we imagine. It is limited to human knowledge and also highly depends on data that get from us. Because of that our expectation from AI also based on our ability and knowledge in Computer science and AI technology (Wronkiewicz Mark, 2018).

As one article on towards data science web page mentions, companies need to hire professional data scientists, invest in AI and Big Data technology and build model serving platforms and be sure that the expectation is not high. To be sure that the projects could be successful, they have to be sure that expectations are not very high before they start anything. It could be some possible to imagine some unattainable expectation but they never come as production (Verre Jacques, 2019).

People's expectations in this survey are realistic in general. People are familiar with this technology and they didn't use any fantastic word about it. Based on all the answers and comments in this survey, participants know the range of science and knowledge today and the possible direction to tomorrow. From figure 23, we see that more than half of responders are familiar with AI and only 6% of them are totally unfamiliar with it. This shows they used already in some parts of applications and know the range of it for today and possible tomorrow.

Actually, it is very complicated to give a right and direct answer to it because our knowledge at the moment is not that enough to know about this case. As the interesting thing figures 17 and 24 show that the percentage of the Yes answer in highly educated people are a little less than the general percentage. The difference is not so much but still high educated people are less optimistic than all people. The yes percentage in highly educated people is 44% in comparison with the general percentage which is 48.5%.

Based on responders' feedback and comments about AI developing, they believe that international Laws should be established since AI is a very good business and might get too many damages done by certain dominant countries without others not even noticing it. Always someone or some groups will want to use this technology for own benefits and accepted international rules and laws could control those groups for the wrong aim. It could be very late to secure after damage, and it is necessary to protect it beforehand and accept strict rules about the developing process.

#### **7.4 Prediction data**

People who have more than basic knowledge about AI, predict that AI could develop itself without human help. Based on figure 40, the prediction percentage on people who believe that AI could develop itself depends on people's knowledge about AI. When the knowledge increase, the percentage of prediction also increases except for people who have enough knowledge. 33% of people with no knowledge, 38% of people with basic knowledge, 61% of intermediate knowledge, 50% of enough knowledge, and 75% of professional knowledge people predictions that it could happen without human help.

Jaan Tallinn, computer programmer and one of the founding engineers of skype mentioned in Mara Hvistendahl's article that "It began three and a half billion years ago in a pool of muck when a molecule made a copy of itself and so became the ultimate ancestor of all earthly life. It began four million years ago when brain volumes began



climbing rapidly in the hominid line". He is explaining this process until now and believes that Artificial Intelligence could continue the process of developing itself as well. Actually, Jaan is looking negatively for this process and he believes that it will not help humanity anymore but still he believes that AI could take a role in developing itself without human help (Hvistendahl Mara, 2019).

Also, from the ROC Curve in figure 42, we see the True Positive Rate with 1 probability which shows our participants predict that AI helping humanity. Researchers have a different points of view about this issue. They believe that some part of AI are helpful for humanity and some other parts are not (Anderson Janna and Rainie Lee, 2018). Especially in morality issues, researchers believe that machines could copy and act like human senses, but it is not a real feeling (Gordon Rachel, 2019). Based on one research from Helsinki University by Docent, Academy Research, Aku Visala, Robots and technology are already in people's lives and those replaced some jobs with the human. The way we are developing artificial intelligence will change our understanding of humanity. For example, understanding and feeling of love and empathy could be a decline in the process of developing AI and machines (Pekka Rautio & Aku Visala, 2018). They believe that "humans behaving like machines will be a bigger problem than machines being human". Means human have humanity spirit but machines don't. If machines being like a human, they could copy humanity actions and senses and decide like a human in different situations. But if human try to be a machine, they have to follow machines rules which it is no human spirit inside it and this situation could create a bigger problem. Better to be machine and act like a human than to be human and act like a machine. In such cases, people could not give the right direction to machines in the developing process. And because of that people have to mind all the time own humanity values and based on that give the order, programs, and direction to machines and new technologies.

The future of AI is highly dependent on human decisions at the moment. This decision could be technically, politically, morality, and many others that important for humanity. In every developing step, we have to mention about these values and be careful to not be ignored because of some countries or someone benefits.

## **7.5 Development Proposal**

People's expectations of AI depend on their prior knowledge and experience. Different cultures and nations have different points of view about this, and we tried to figure out

those differences academically and statistically. Based on the results in this study, we could see that Finnish people are more ready to prepare an accept new AI-based services and applications because they are already familiar with AI and the process of AI development.

For example, some hospitals are already using robots which are doing different actions from medical care to surgery. These robots are starting to have contact with people and some nations are not happy, for they do not trust them. But Finnish people trust machines' actions in hospitals, and they don't have any problem with it. Based on the results of our study, Finnish people could also accept robots with AI technology in the health care system and developers could work on such projects to develop AI in robots. This study provides an input specifically for practitioners on the importance and expectation of people from designers and service developers.

One of the aims for this thesis was to investigate and reveal people's expectations of AI from various perspectives. What people know about AI and the process of developing it, and also what people expect from a developed version of it.

Especially in developing AI and defining a goal for it, it is very important to investigate people's needs, demands, and expectations for AI-based solutions. From the results of this survey, we could easily see that people will not be happy to give all power to AI, because they still prefer humanity's power and decisions over AI decisions. They want limitations in power and field to AI even when they are happy with AI benefits and have accepted to see it in daily life.

The study shows that the majority of people are still skeptical about the use of AI-based applications for security and privacy reasons. People have concerns about the last power of AI. They can see the benefits of it but at the same time, the last point and aim of AI, is still unclear, which could be reached. Developers have to always mention people's concerns in the developing process. Especially in AI further development, they have to remember to leave the last control under human hands and do not let machines develop themselves without humans.

From this study, we can see that the Finnish community is ready to use AI's technology in different parts of life and they are able to accept new versions without any serious barriers. Finnish people were introduced to technology starting from primary school years and it affected people's views on new technologies since then.

This study was started before the COVID-19 pandemic disease in the world, but the last part of this document was written during the quarantine time with COVID-19 affections in Finland and the world. In these times we saw how fast people and students in Finland, even very young students adapted to study from home via the internet and also we saw how fast students learned the new system and new tools to use distance study materials and distance work. This experience showed in practice how new technology and systems are used for Finnish people and how they could use it in different situations.

Two very important results from this survey for myself was that people accept AI developing but with limitation. This means that especially in developed countries, AI will not face huge challenges in the developing process and people are ready to be compatible with it.

Based on the study result, we suggest that politicians have to design a very exact and detailed road map and rules for AI developers. This road map should show all concerns and limits for developers that people worry about. They have to have a mechanism which controls all process of the development of AI. The developers have to develop in such a way in which new versions could be reversible, in case something goes wrong. And also people must get more knowledge about AI technology and AI's roles. If people get the basic knowledge about it, they could manage how and which applications they want to use. In such cases, people could feel more secure and safe about giving data to AI technology in different applications.

## **8 Summary**

AI technology has shown itself in people's daily life and people are happy with that. They believe that it is created to help people and it already does. AI makes people's lives safer and easier. People support AI development for the future, and they are not worried about it. Some limitation for developed versions is the only thing which people highly want it. They hope humans could have control all the time on AI and they could stop the process any time they want. For secure development in the world, people hope international laws and rules which could take under control the whole process all the time.

People will see AI technology and machines more and more in daily life in the future. The majority of people especially educated people are ready to face a new life with AI technology. They believe that AI will have more benefits than threats for humanity in the

developed version. The only concern about AI's future is taking control by machines in the future and the majority of people support such rules and laws which limit machines power and give control to human all the time.

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## Appendix

### Questions

Google form short link: <https://forms.gle/o7TwEbHgwRYZqB8y5>

Google form original and long link:

<https://docs.google.com/forms/d/e/1FAIpQLSd4oDlpaC75i6l7TRnUp4OQr3jy09oy1wjD4m3a23diHMzfxQ/viewform>

#### 1- Gender

- Male
- Female
- Undetermined

#### 2- What is your age slice?

- Under 20
- 20-30
- 31-40
- 41-50
- 51-60
- Over 60

#### 3- Education

- Basic education
- High school
- Bachelor degree
- Master degree or up

#### 4- Nationality

5- How much are you familiar with Artificial Intelligence (AI) technology?

- Not at all (0%)
- Very basic information (Under 20%)
- Intermediate (21% -50%)
- Enough knowledge (51% - 75%)
- Professional knowledge (76% - 100%)

6- Do you think you have already used AI-based solutions?

- Yes, I have already used it
- Yes, maybe, I am not sure whether I have used it or not
- No, I do not think the AI based service exist

7- Do you believe that AI helps humanity?

- Yes, how
- No, why
- I don't know

8- What are you expecting on AI technology? (Multiple choices)

- ✓ Help humanity in different fields such as health
- ✓ Make our life easier
- ✓ Enforcing our capabilities on life and work
- ✓ Give us high-security guaranty
- ✓ Increase life expectancy
- ✓ None of them

9-Do you think AI makes you unemployed ( takes your jobs)?

- It is not important for me
- I am a little worry about that
- I highly worry about that
- I don't think that it could happen

10-Do you think that AI impacts all fields of our lives or it affects only to a special field?

- It will reach to all fields
- It will take the majority of human works
- It will take only some part of human works and people will have enough tasks to do
- AI cannot compete with human, since human create AI

11-Do you support further AI development, e.g., AI for AI?

- Of course. We have to develop until the end
- Yes but not in all fields.
- Yes but with some limitations.
- No. It is dangerous for humanity and we have to stop developing
- Even current AI technology damaged our life and we have to go back to life without AI technology

12-Do you think AI technology can take roles which have been specific only to human race? Like risk management or moral related issues or human senses related issues.

- Yes. In a developed version, it can take responsibility for even moral issue
- No. some part of roles highly depends on the human capabilities and AI is fail to achieve for example moral issues
- Yes, but I am not sure how
- No, but It is impossible

13- Could AI technology reaches that point which develop itself without human support?

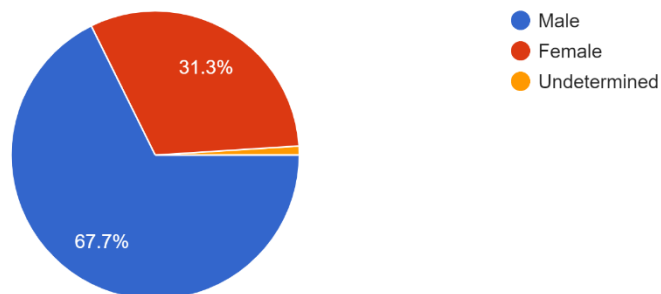
- Yes, it is possible
- No, it is impossible
- I am not sure

14. How you see AI technology 10 years later?

- It is a part of human lives which help people under human control
- It is a part of human lives which AI has the full control
- AI machines took all controls and people are machines' slaves
- No significant changes will occur and people still rule the machines

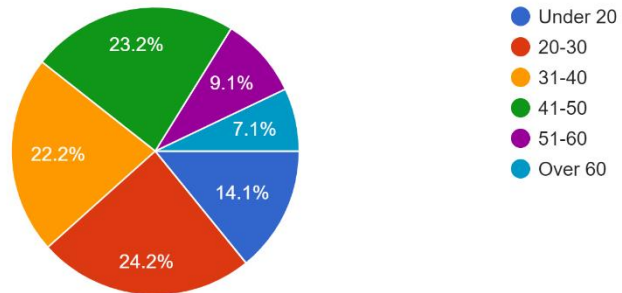
**Survey answers in colored chart form from Google Form**

1) Gender  
99 responses



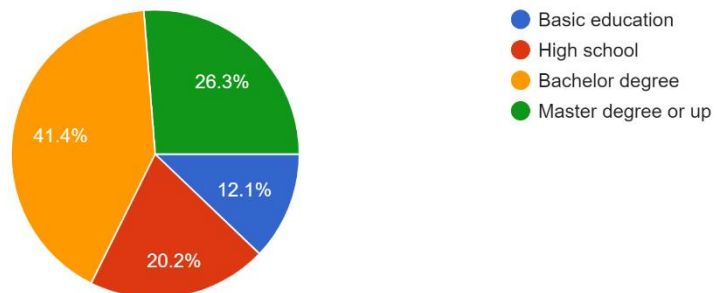
## 2) What is your age slice?

99 responses



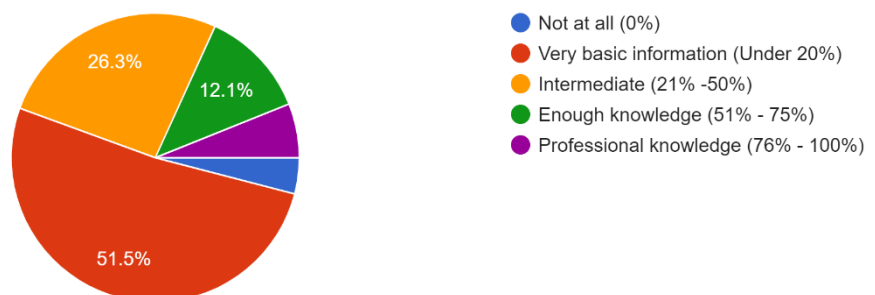
## 3) Education

99 responses



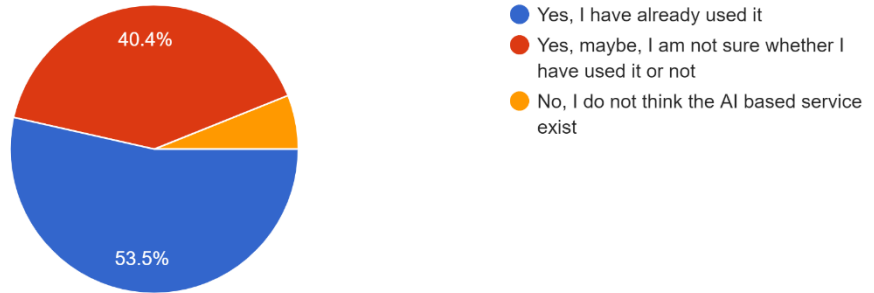
## 5) How much are you familiar with Artificial Intelligence (AI) technology?

99 responses



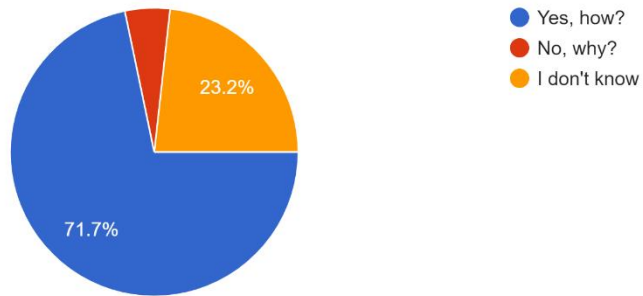
6) Do you think you have already used AI-based solutions?

99 responses



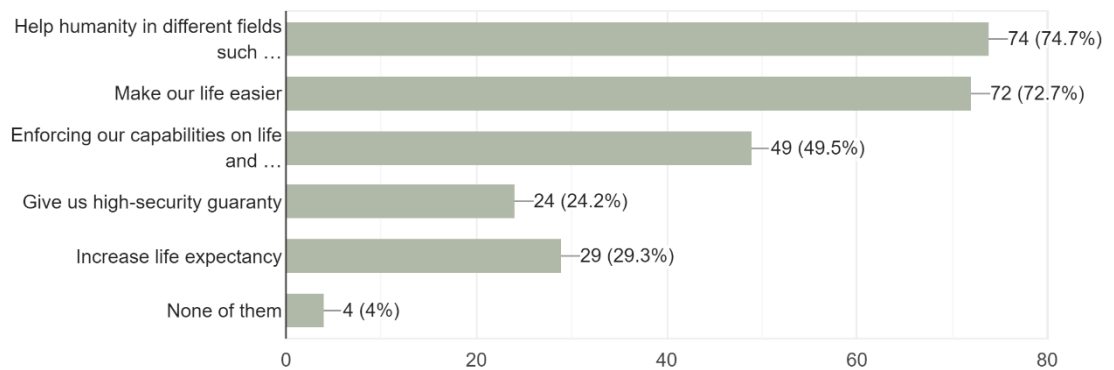
7) Do you believe that AI helps humanity?

99 responses



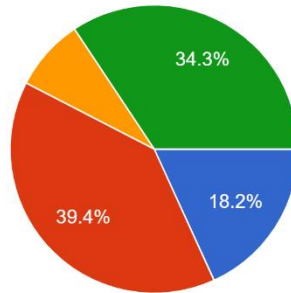
8) What are you expecting on AI technology? (Multiple choices)

99 responses



9) Do you think AI makes you unemployed ( takes your jobs)?

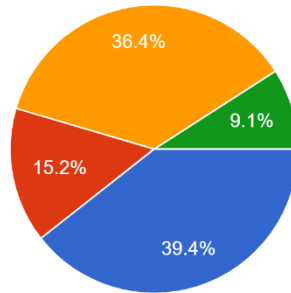
99 responses



- It is not important for me
- I am a little worry about that
- I highly worry about that
- I don't think that it could happen

10) Do you think that AI impacts all fields of our lives or it affects only to a special field?

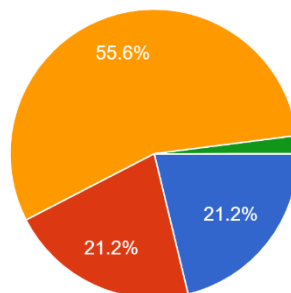
99 responses



- It will reach to all fields
- It will take the majority of human works
- It will take only some part of human works and people will have enough tasks to do
- AI cannot compete with human, since human create AI

11) Do you support further AI development, e.g., AI for AI?

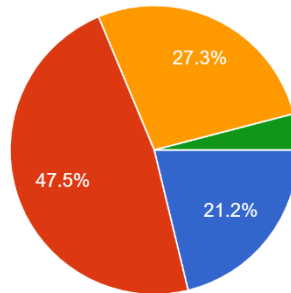
99 responses



- Of course. We have to develop until the end
- Yes but not in all fields
- Yes but with some limitations
- No. It is dangerous for humanity and we have to stop developing
- Even current AI technology damaged our life and we have to go back to life without AI technology

12) Do you think AI technology can take roles which have been specific only to human race? Like risk management or moral related issues or human senses related issues.

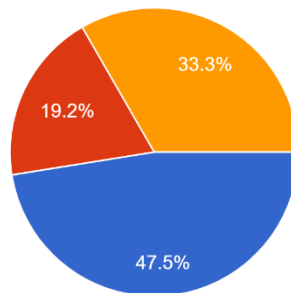
99 responses



- Yes. In a developed version, it can take responsibility for even moral issue
- No. some part of roles highly depends on the human capabilities and AI is fail to achieve for example moral issues
- Yes, but I am not sure how
- No, it is impossible

13) Could AI technology reaches that point which develop itself without human support?

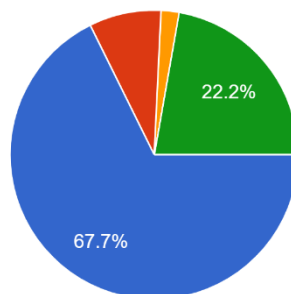
99 responses



- Yes, it is possible
- No, it is impossible
- I am not sure

14) How you see AI technology 10 years later?

99 responses



- It is a part of human lives which help people under human control
- It is a part of human lives which AI has the full control
- AI machines took all controls and people are machines' slaves
- No significant changes will occur and people still rule the machines



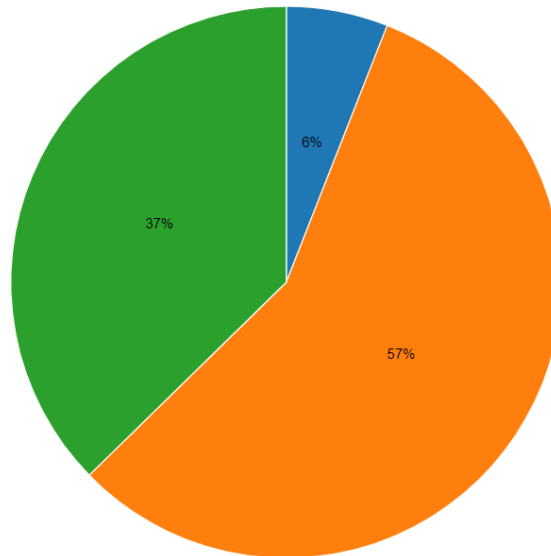
## Question results for high educated people

Do you think you have already used AI-based solutions?

High education people's point of view



● No, I do not think the AI based service exist ● Yes, I have already used it ● Yes, maybe, I am not sure whether I have used it or not

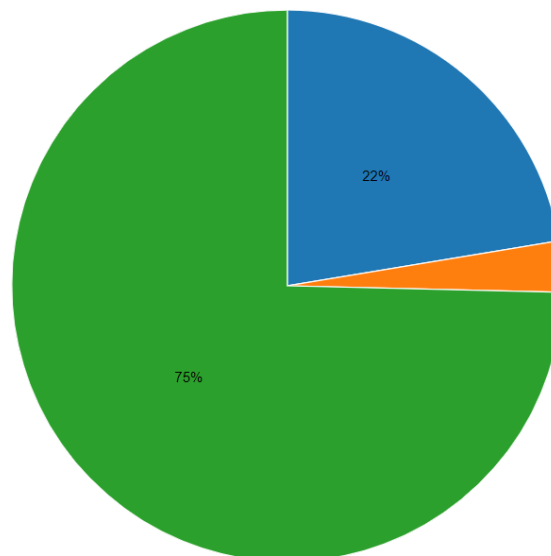


Do you believe that AI helps humanity?

High education people's point of view



● I don't know ● No, why? ● Yes, how?

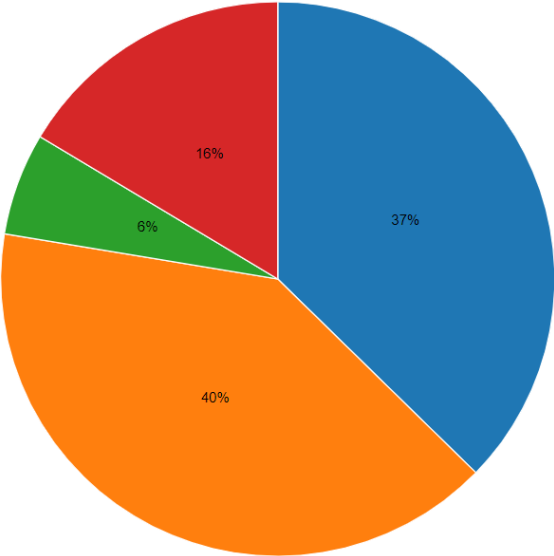


# Do you think AI makes you unemployed?

High education people's point of view



- I am a little worry about that
- I don't think that it could happen
- I highly worry about that
- It is not important for me

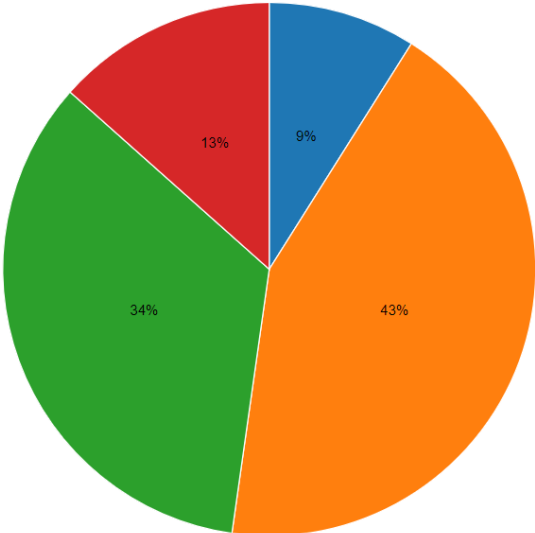


# Do you think that AI impacts all fields of our lives or it affects only to a special field?

High education people's point of view



- AI cannot compete with human, since human create AI
- It will reach to all fields
- It will take only some part of human works and people will have enough tasks to do
- It will take the majority of human works

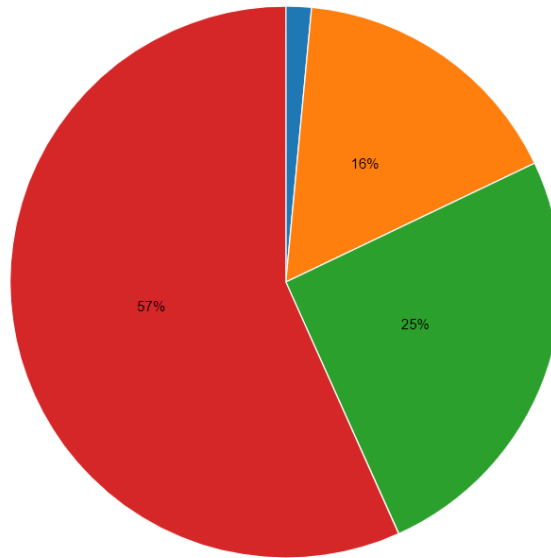


## Do you support further AI development, e.g., AI for AI?



High education people's point of view

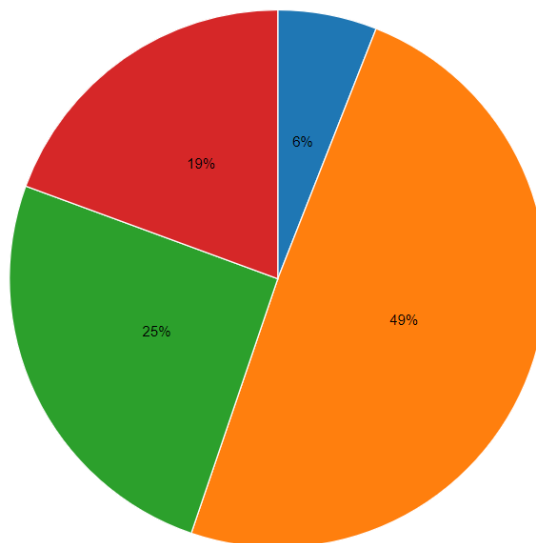
● No. It is dangerous for humanity and we have to stop developing ● Of course. We have to develop until the end ● Yes but not in all fields ● Yes but with some limitations



## Do you think AI technology can take roles which have been specific only to human race?

High education people's point of view

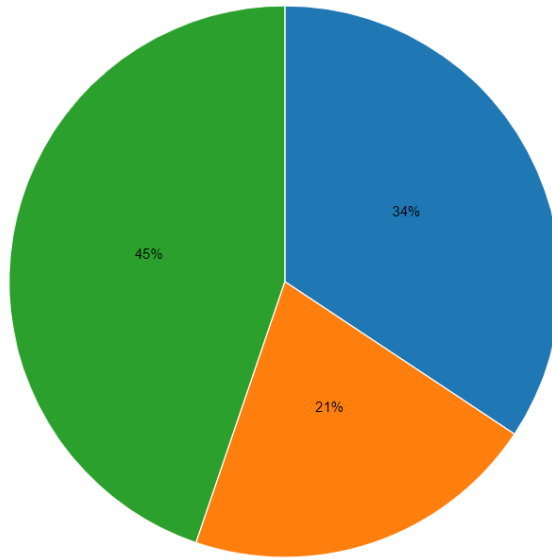
● No, it is impossible ● No. some part of roles highly depends on the human capabilities and AI is fail to achieve for example moral issues ● Yes, but I am not sure how ● Yes. In a developed version, it can take responsibility for even moral issue



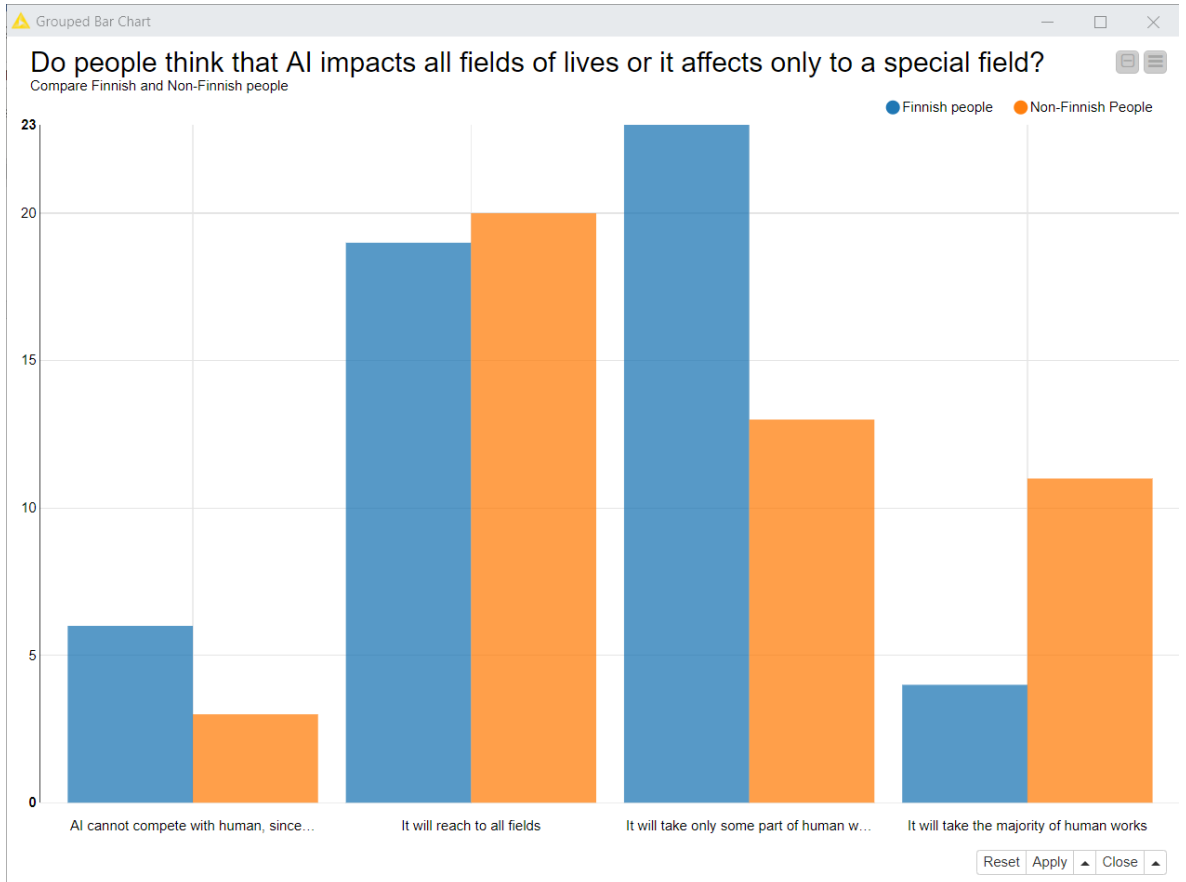
# Could AI technology reaches that point which develop itself without human support?

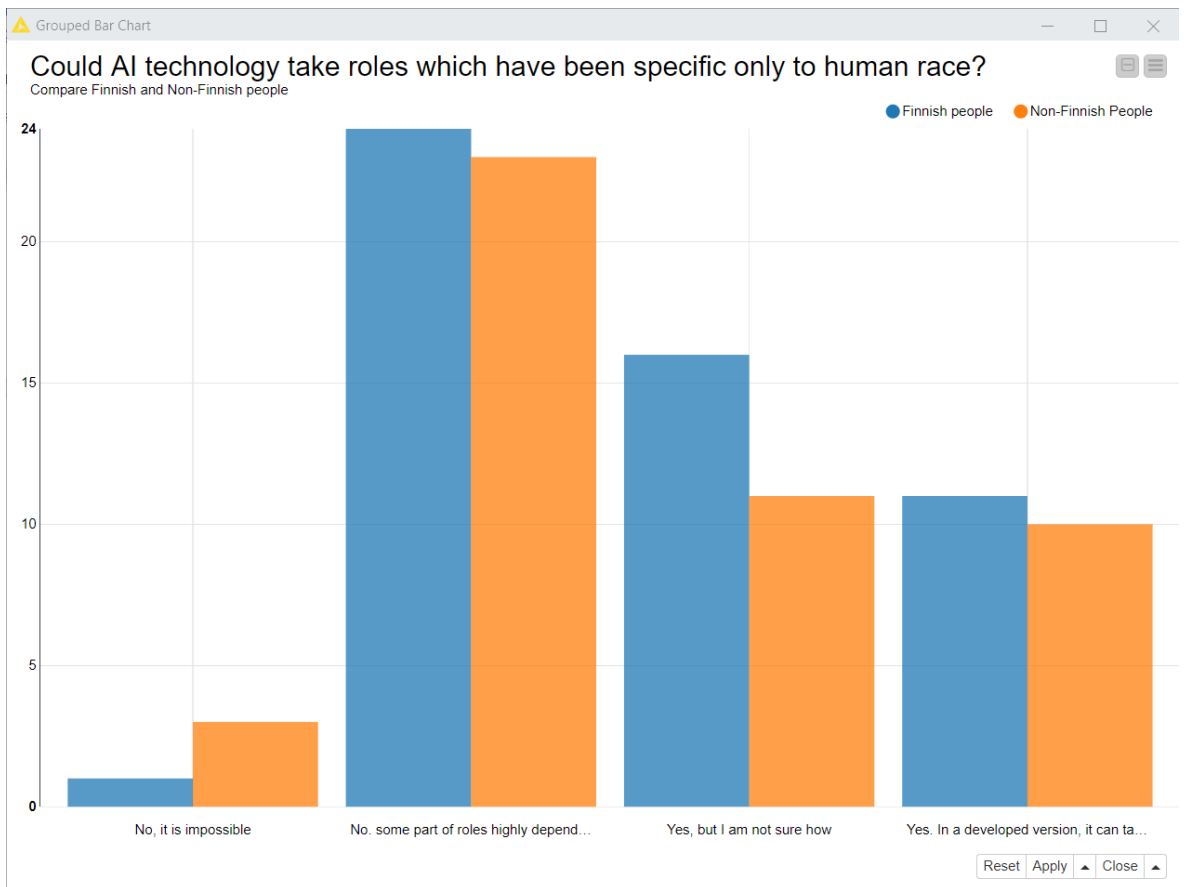
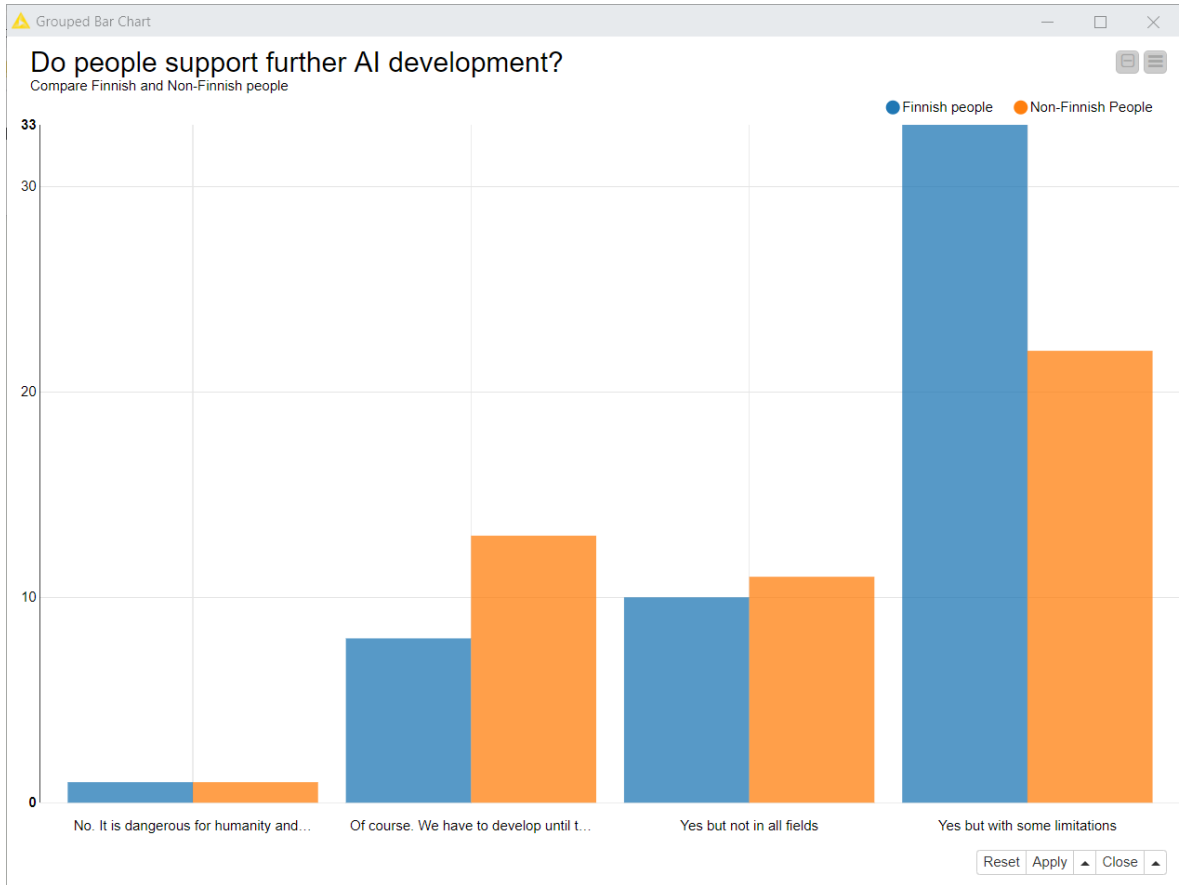
High education people's point of view

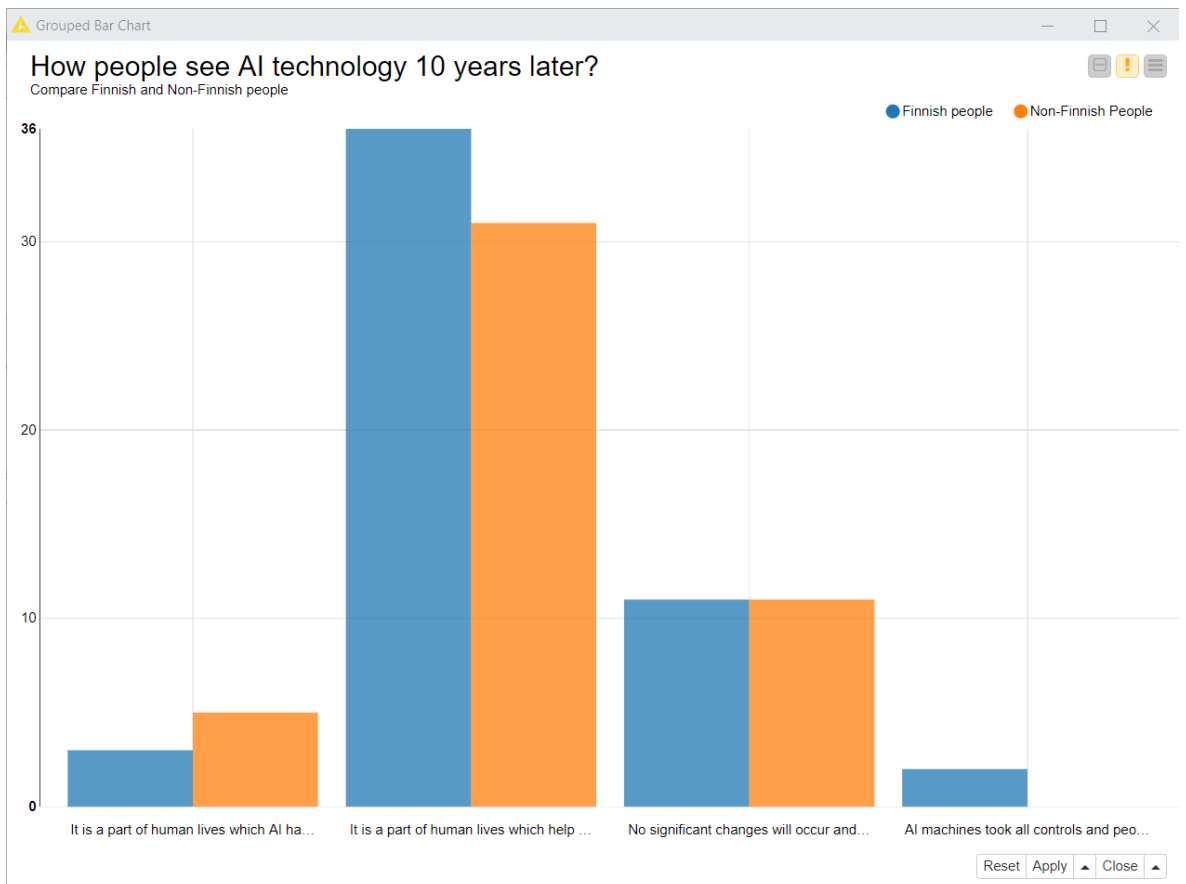
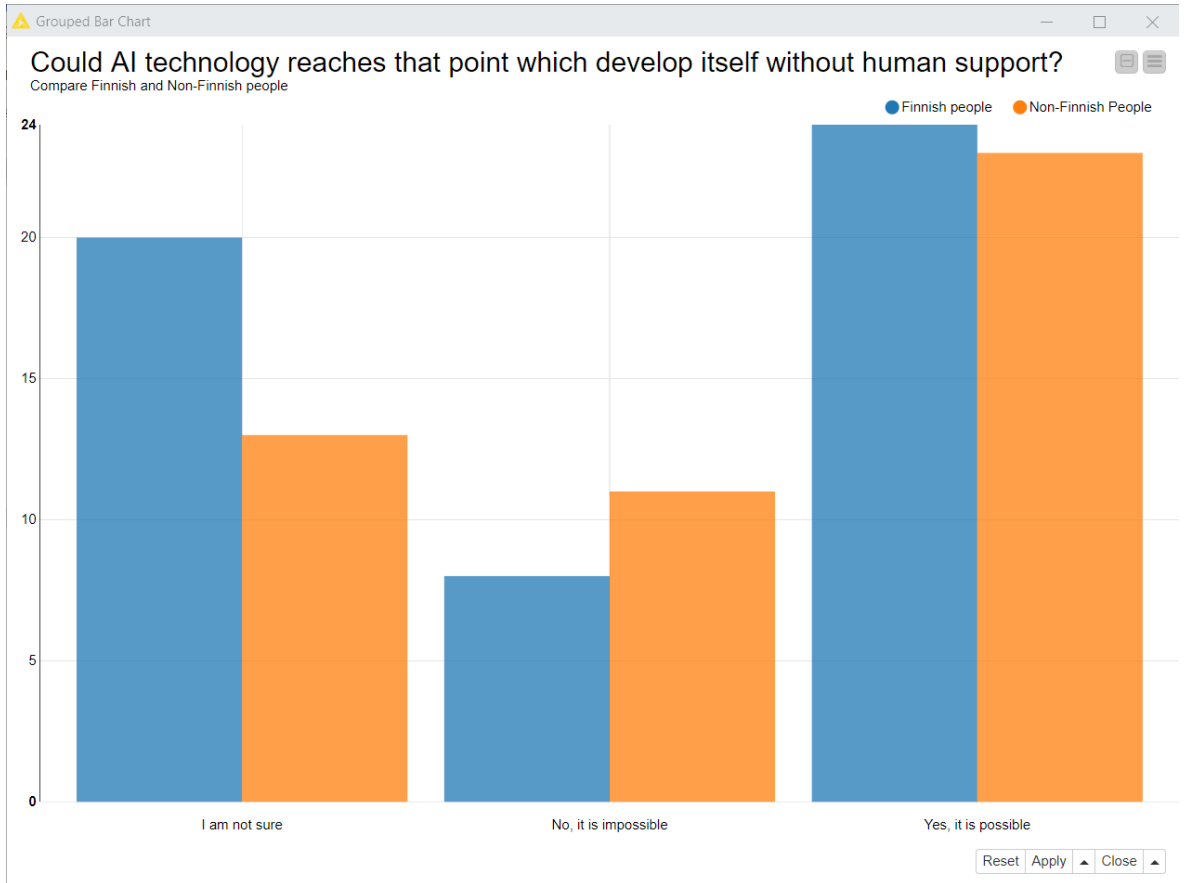
I am not sure No, it is impossible Yes, it is possible



## Compare results between Finnish and Non-Finnish people







### ***Participants feedback about helping AI to humanity or not***

People believe that it helps the humanity have such feedbacks as:

- AI allows people to process more information than ever before and automate processes that could not have been automated previously
- AI can greatly reduce errors in risky tasks. Can help in decision making. A worker running ok AI for example in manufacturing needs less rest.
- AI can help people using a computer find information and fulfill certain tasks lot quicker and easier.
- AI can help predict outcomes of situations faster than humans, also AI can predict MORE outcomes than humans.
- Ai can reduce human errors and make things quicker, maybe.
- AI doesn't use emotional/anecdotal thought processes to produce solutions.
- AI helps to solve issues that only humans could solve in the past
- AI in for example in the medical filed has a much higher accuracy to find cancer.
- AI is already part of many analysis endeavours in e. g. medicine and helps to find quicker and more reliable solutions. AI helps to reduce errors and speed up the process by supporting humans in their tasks.
- AI makes processes and decisions faster. AI-based apps make life more convenient.
- AI technology helps humanity with different areas in medicine
- Already in use e.g. prediction of development of condition of extreme premature birth babies.
- Anything that handles a large amount data or work autonomously can be considered as an AI. Thus, helping us every day
- Artificially intelligent algorithms don't make the mistakes as the humans, for example, the software engineers could code each time in a different way, and each person will choose the personal way to code and it is sometime difficult to the other coders to understand or to change the code... AI technology could recognize the words in context, faces on the videos or pictures and analyze it and use for decisions in security, health, business...
- Banks, social media, smart cars...etc
- Better and quicker decisions based on bigger amount of data
- Bring more facts quicker for risk based decision making

- Complete understanding of AI potential will come with use, over time. We must also clearly evaluate the risks involved in it, particularly in relation to high value or strategic uses.
- E.g. to find different approaches to things people don't see.
- For example, they have used AI in multiple surgeries, for example face-transplant (serious ones)
- Having simple, mindless jobs done by AI will make companies more efficient.
- Helps complete different tasks faster.
- Helps to perform many monotonous tasks like vacuuming the home
- Helps us to analyse information quicker and in a way we might otherwise overlook.
- Industries, production, mobility and transportation, assisting people in labor, developed ict services, health care, forecasting, new occupations, automation, customer service, image classification, face recognition, machine translation, document analysis, collaborative robots and augmented intelligence etc..
- Internet's most important role in the lives processes of society and human, also other technologies that have become more effective in the lives.
- Internet's most important role in the lives processes of society and human, also other technologies that have become more effective in the lives.
- It can be used to do jobs and to work out complex problems.
- It can complement human intelligence and play a supporting role
- IT can help by analyzing vast amounts of data and processing it more quickly and precisely than humans.
- It can help in many industries, for example, agriculture, education, construction, etc. All physical activities could be assisted by AI
- It can make lots of long manual process automated, error free and valuable.
- It can make our life easier
- It could give us more opportunity to become more skilled and knowledgeable over time.
- It could help people with phisical disorders to see the world, to be a part of the world they could not see otherwise.
- However, I think it could be dangerous because people without challenges feel frustration and anxiety.
- It helps to optimize our daily works and behaviors
- It helps to simplyfy processes



- It makes solving some difficult problems which take a lot of time easier
- Make fast
- Make life easier and fast
- Make life easier and fast
- Makes it faster for us to do the things we want.
- Makes many things easier and accomplishes things humans can not. However, I believe that it has many negative sides/dangers to it too.
- Makes some part of life easier
- Pattern recognition. Sorting data. Use AI in medical field in radiology or other scans
- Plenty of examples. Predictive forecast models like weather, space. Human-Machine integrations, connected appliances helping remote medical treatments
- Provides automation of processes.
- Robotics use and such similar use
- Saves time & all kind of energy, has higher accuracy, higher efficiency than human.
- Technological advancement is always beneficial. AI can be used to, for example, find cancer tumors.
- The AI can help in several tasks with limited human provision
- Think about Google translate. I use it a lot translating several languages into English for both work and personal purposes. Google translate is able to work better this days due to technologies make possible by ML.
- Our keyboards are able to predict what we would write next (better than any dictionary list could) by relying on ML.
- This are just 2 examples I use daily. I wouldn't talk about Facial recognition technologies because it is still debatable if the technology would prove to be a net good for the world.
- To analyze some needs to provide new services or for services to make them more efficient.
- Understanding complex systems
- Visualization of processes
- Will replace some boring tasks that humans must do like costumer support or other services.
- With AI human being will be able to build his future in a better way

- در حوزه بهداشت و سلامت پیشبینی بلاهای طبیعی. جلوگیری از قاچاق انسان و کالا. تشخیص بیماری های مرگبار و جلوگیری از سرایت آن به انسان و حیوان هشدار های له موقع محیط زیستی و حفاظت از آن و کلا در ..... راستای بهبود زندگی انسان و

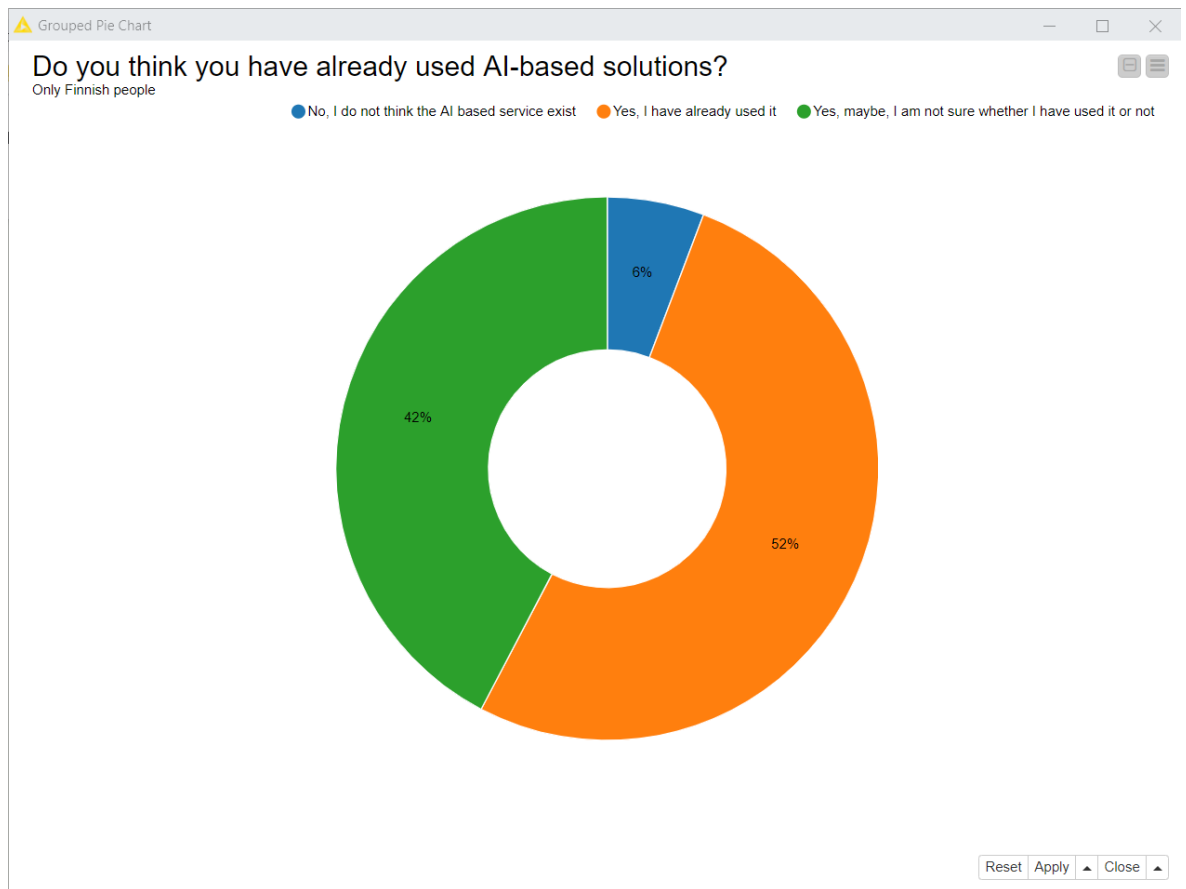
People who believe that it is not helps to the humanity have such feedbacks as:

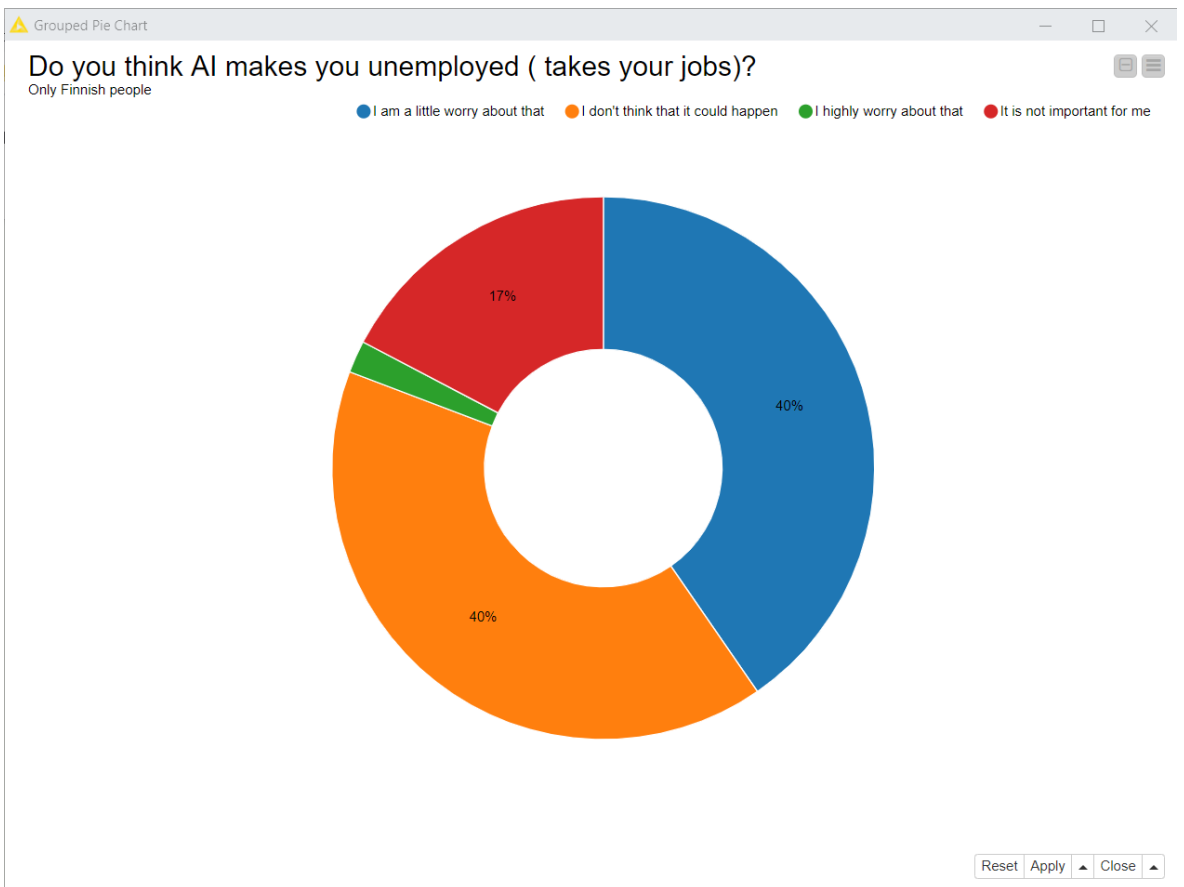
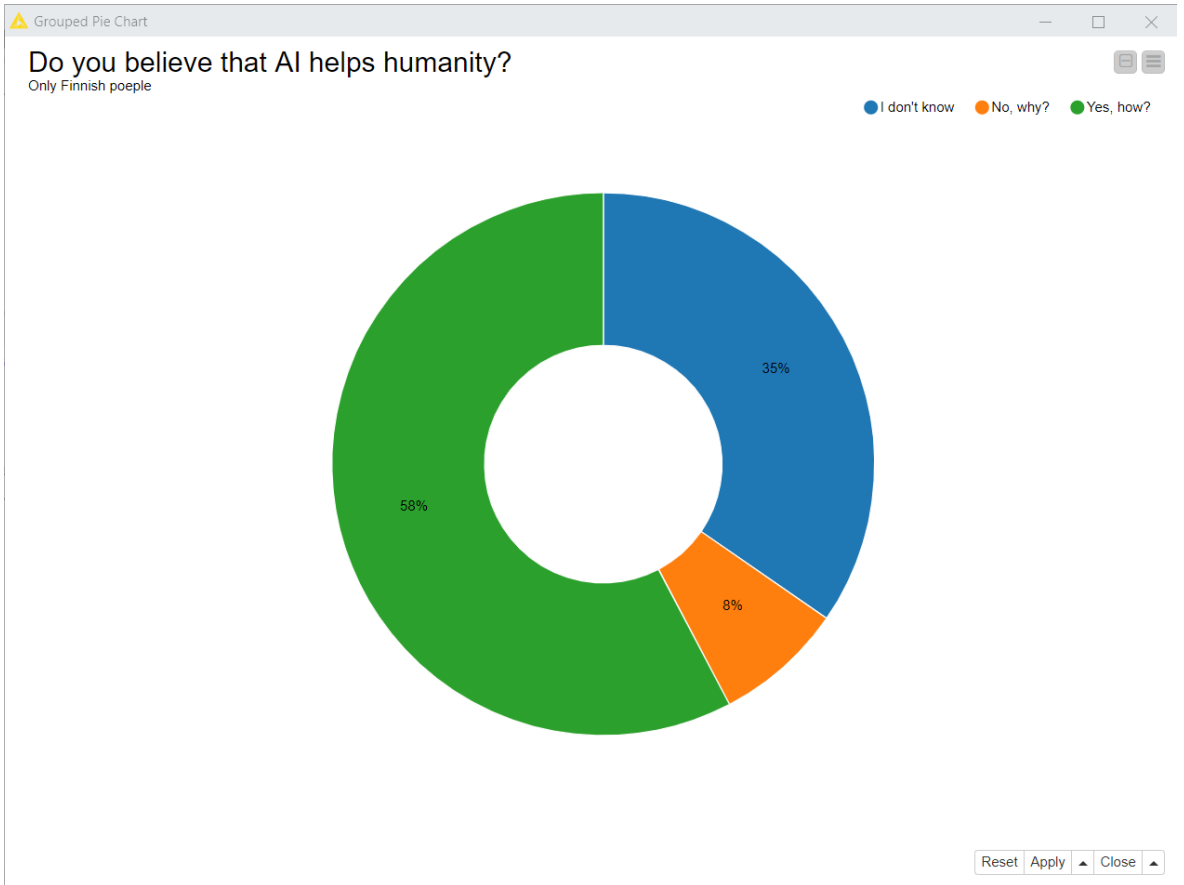
- AI brings more and more technology in our lives, which may sometimes put a distance in between people and their lives.
- In what sense?
- Humanity can not be processed by machines, it is a gift from God
- There is a possibility that it may end the human race altogether as AI will replace humans in their own jobs.

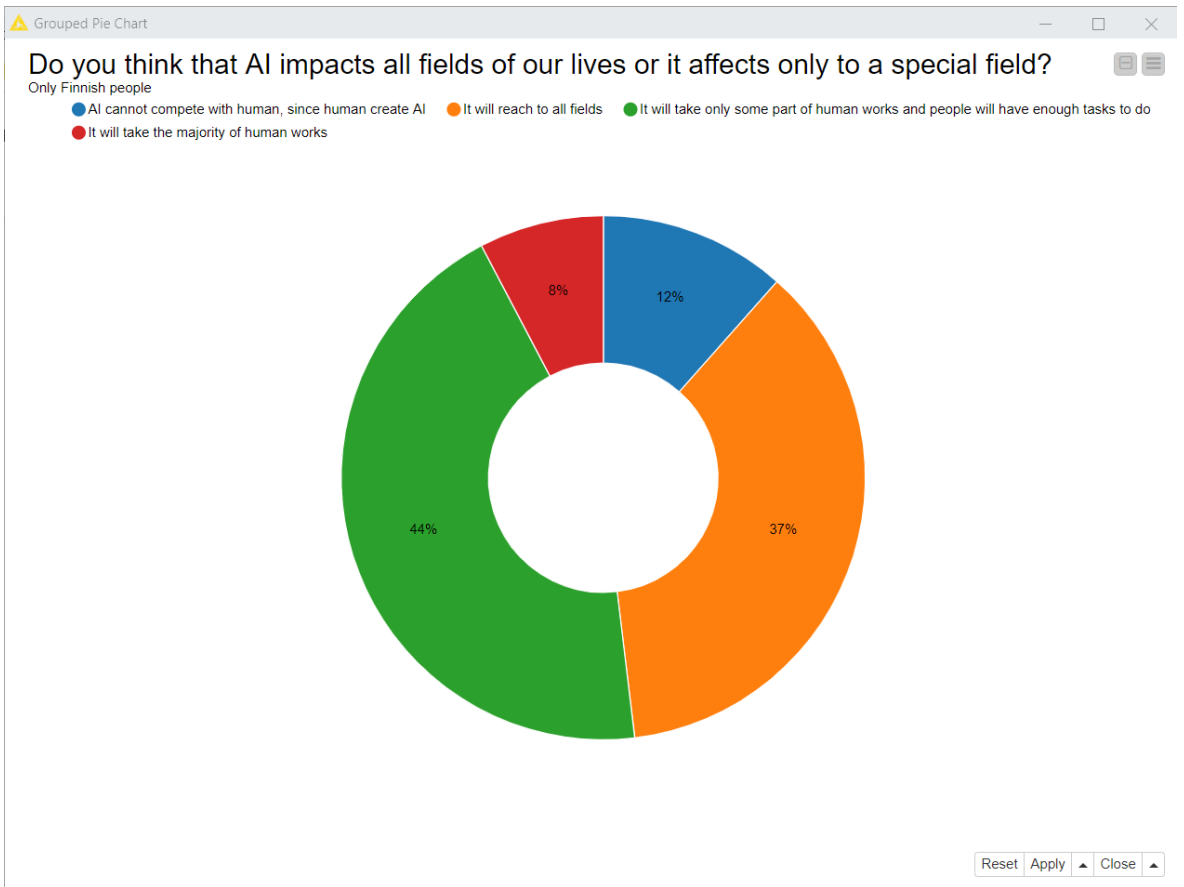
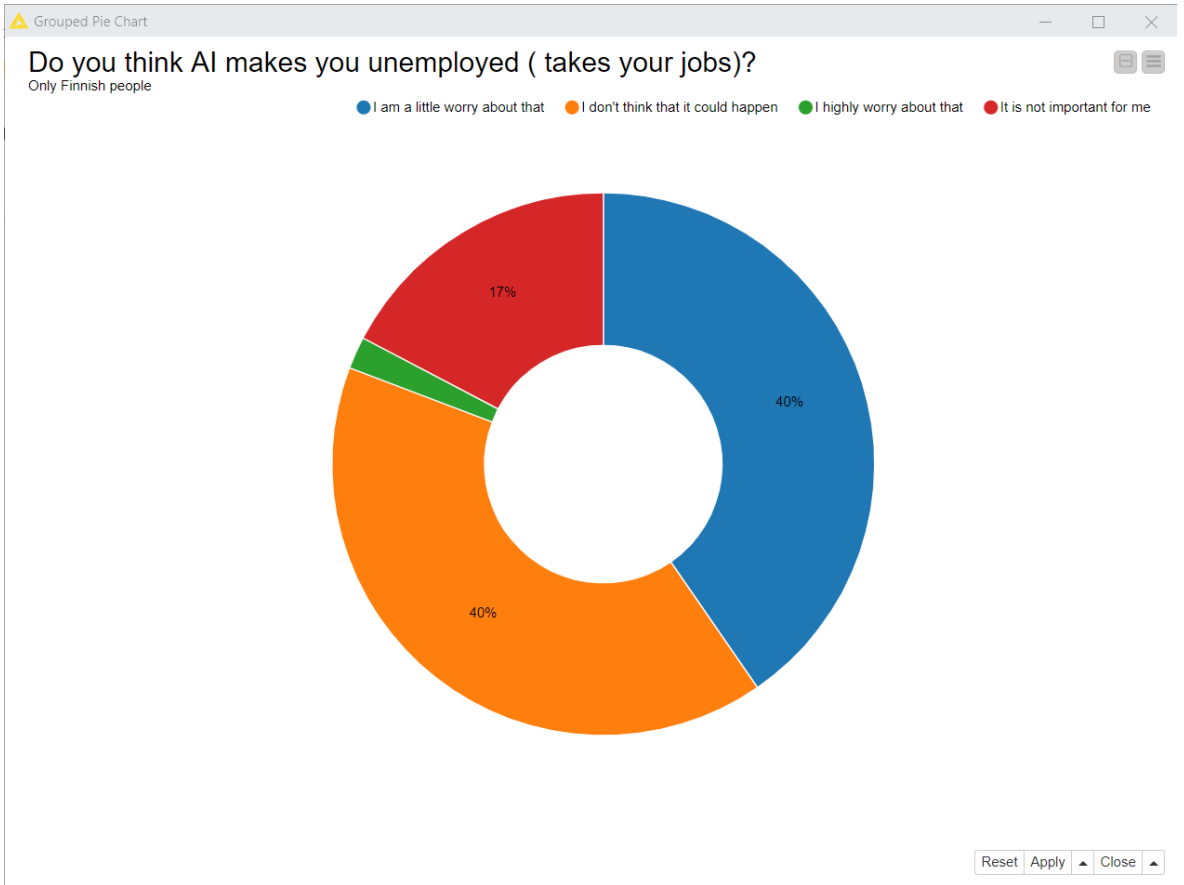
People comments who they are not sure either it helps humanity or not

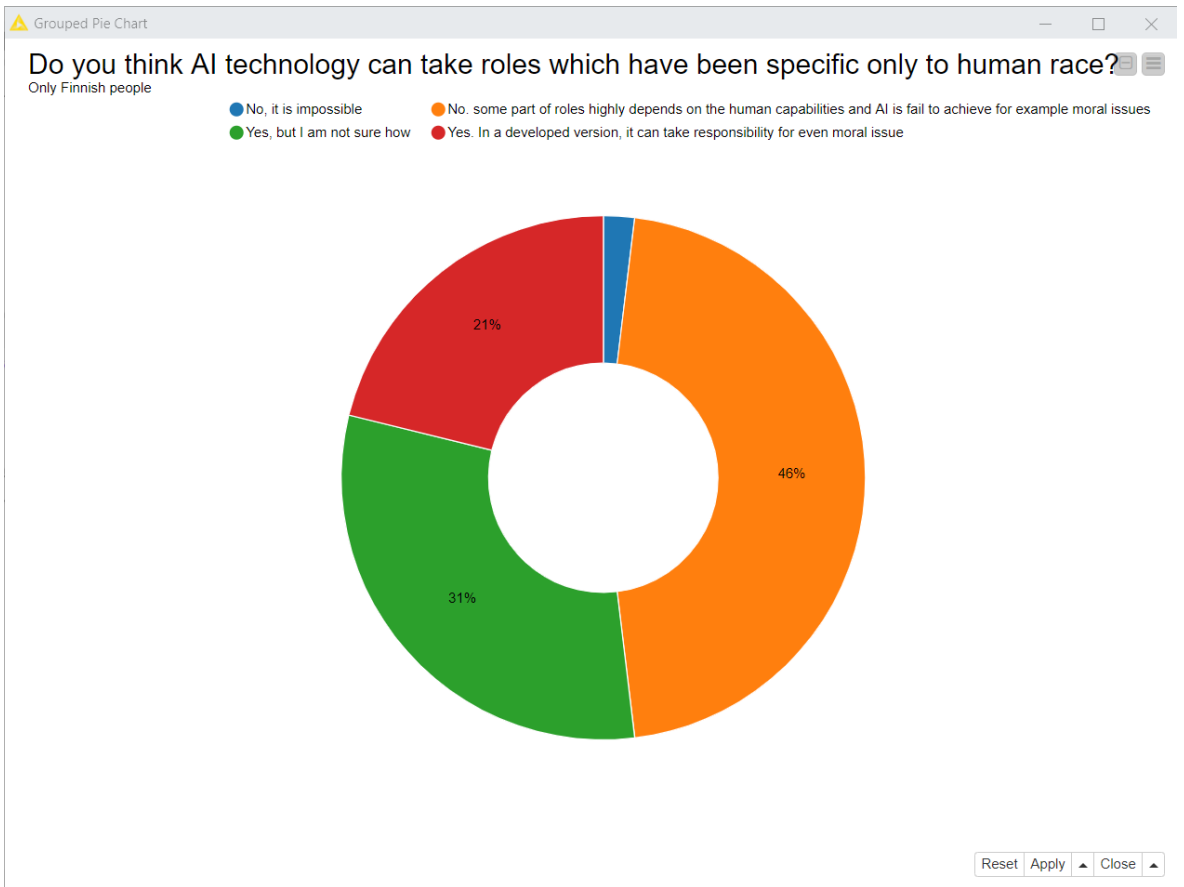
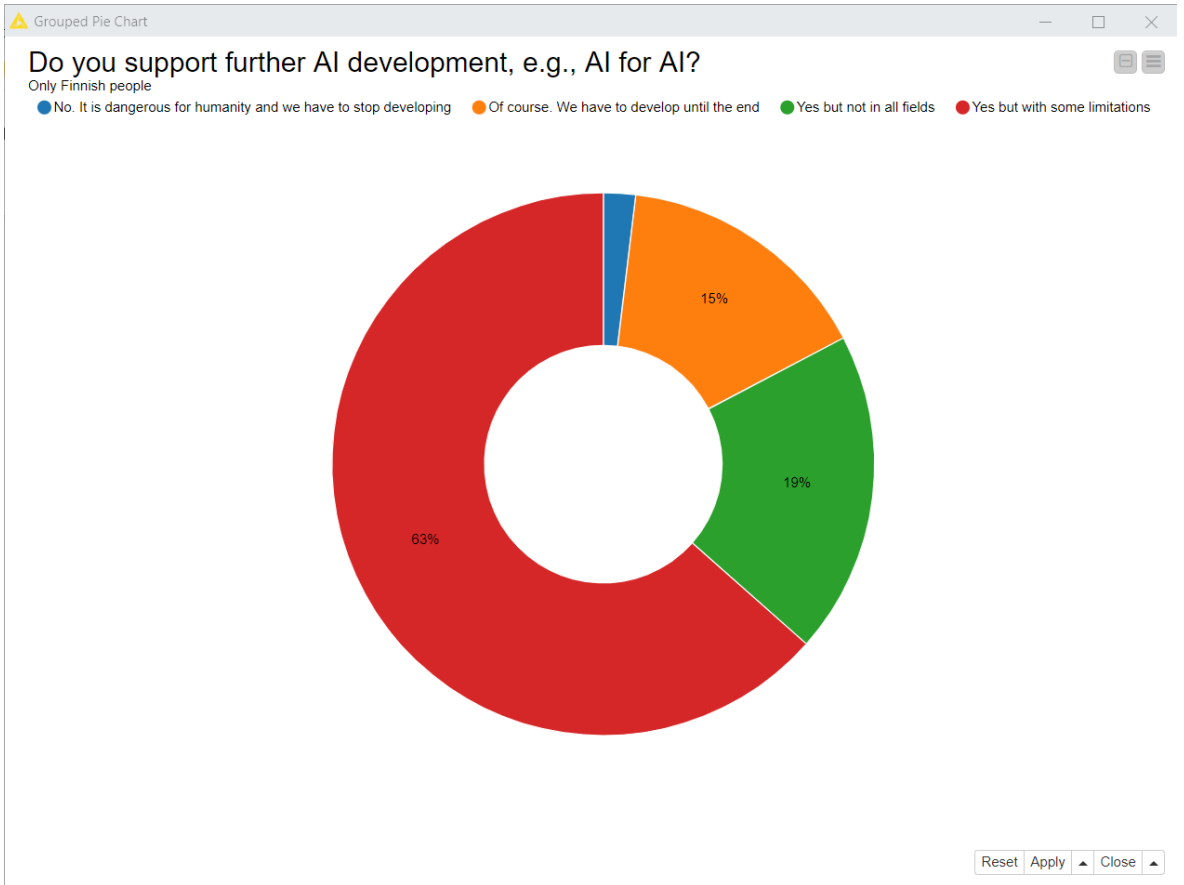
- The reduction of human jobs as a result of AI combined with increasing global population could lead to disenfranchisement.
- On some ways it does but most of them are unfamiliar to me. I know theres some Image recognising AI for some forms of cancer. Also If machine learning is counted as AI then data management IS huge. Self driving cars exist and there are AI that plays some games bettter then people.
- Might and might not, depends on how people will use it.
- I'm sure it will change things, and some of the applications will be very useful. But since there are risks as well, I cannot say if the effect is likely to positive or negative in the long term
- I'm not able to answer to this question.
- I see there's a possibility to either helping or harming
- I don't know
- I don't think I know enough to make a decision
- I don't even know what it is about

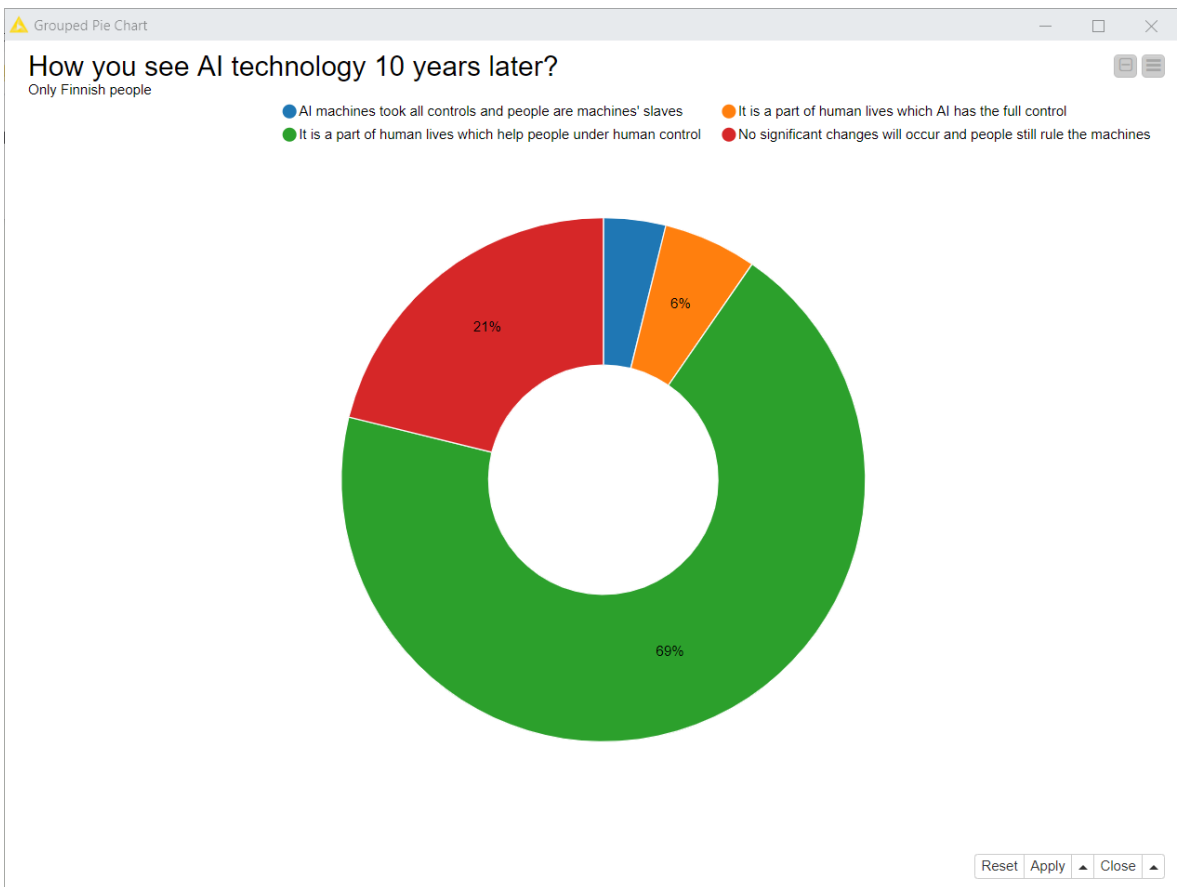
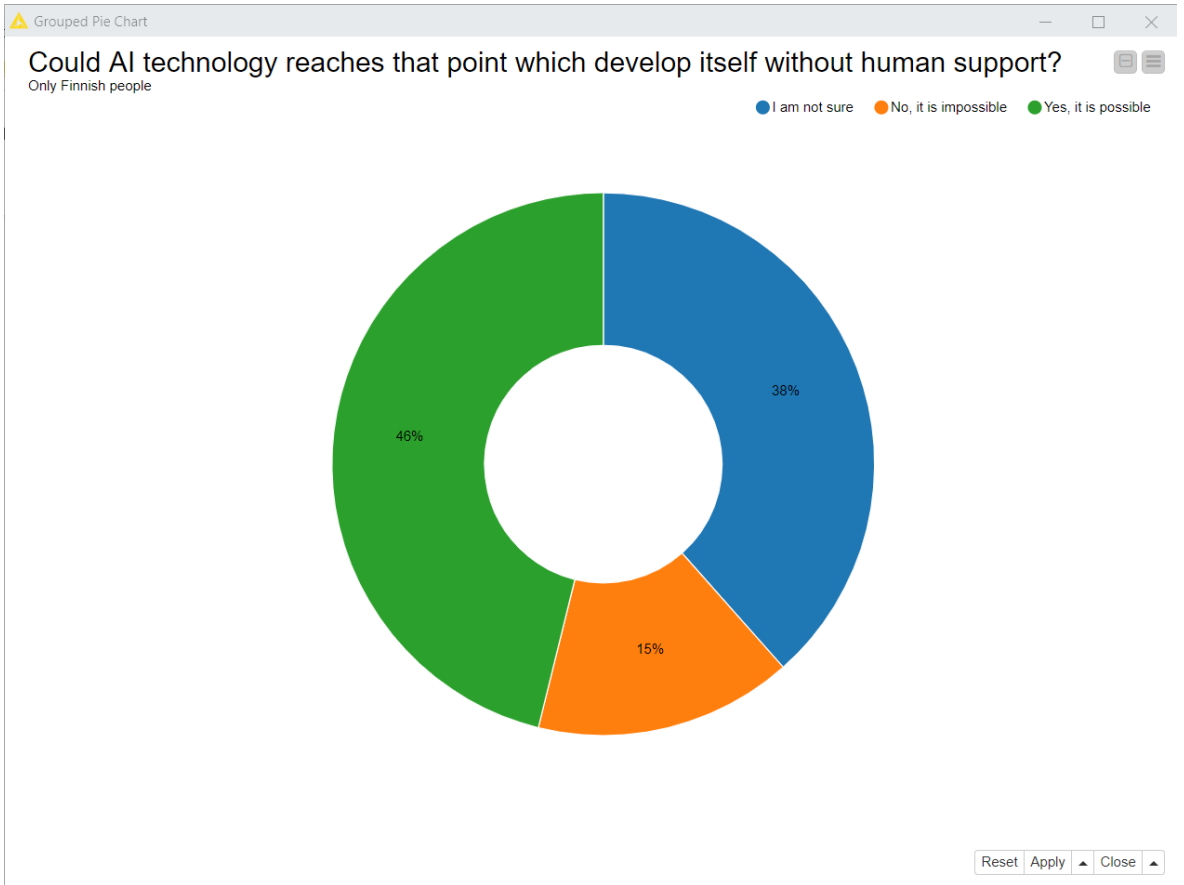
## Question results in Pie Chart format for only Finnish people











### Question results in Pie Chart format for only Iranian people

