Human Brain Project

Citizens' View on Neuroscience and Dual Use

[Slovakia]

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FONDEN TEKNOLOGI RÅDET
DANISH BOARD OF TECHNOLOGY FOUNDATION

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Co-funded by the European Union

The research leading to this result has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 720270 (HBP SGA1).

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Summary of results

Overall, there was a variety of attitudes towards the discussed topics ranging from positive approach to the development to the negative one. There was also a frequent opinion that whatever is going on the regular people cannot influence it. And all of these attitudes were represented at all the discussion tables.

The main concern across the themes was the loss of humanity (if technology prevails). As related to the central topic, the participants highlighted mostly a need to respect human nature and individual right to self-determination. In other words – not to be dependent on any – be it for any great benefit – technology.

The participants were as well concerned about the threat of manipulation of emotions and thoughts of ordinary citizens (for future use of brain research) either because of abuse or hacking of the "system". They spontaneously reflected a general feeling of being manipulated (with the silent agreement of the state), mainly by the financial sector (to take loans), by pharmaceutic industry via medical doctors who push them to take specific medicines, by media (to buy goods).

The big concern was mistrust of state power and its integrity in terms of control over the exploitation of the results (some people mentioned the period of the former Prime Minister Vladimír Mečiar when the ruling party abused the state to strengthen its power and intimidate citizens). Most frequent, spontaneous direction of discourse at the tables concerned a general distrust to authorities and to spending public money for private profit (not exclusively for scientific-research purposes). There were concerns expressed in particular about the misuse of research results for “evil” and immoral purposes (e.g. international conflicts).

On the other hand, the participants displayed a significant decrease in individual agency, an inclination to paternalistic values. And a generally low trust in their own capacity to influence public issues. They focused especially on the comparison of past and present, as it was difficult for them to imagine the future.

Results from Round 1 – Research and Dual Use - Overall principles

In discussions, the participants agreed that the cooperation is needed to avoid stagnation. The results should be public, people familiar with them and they should not be used against the people. Generally, the majority of participants expressed trust in specialized institutions (Ministries of Interior, Education, Defence, Slovak Academy of Sciences, Universities, Hospitals, etc.). They believe in a research which shifts the development of "human race" to the better; therefore it is not important who finances it.

It is not a fundamental problem to bring together the means of civil and military research. Even though if it means a cooperation between military powers. For Europe, a collaboration is desirable because the United States has a top-level research. Europe should not lag behind the US or China. From the Slovak perspective, we should support the common EU approach. Slovakia is a small country so it can afford only low funding for civil and military research and it must rely on the EU and NATO respectively.

Some participants said that everything can be misused. Secret services can get to any information. And the public research will anyhow end up in the hands of the army as that is where the biggest profits are made (look e.g. at the situation in the United States). It cannot be avoided but you have to be prepared for that. And it is ok if it is to help fight the terrorism. The public scrutiny is needed (means, efficiency). It is necessary to find the limits of exploitation and abuse. There are concerns about misuse by other organizations and state powers. Moreover, there is an ongoing blurring the lines between the military and commercial use. The army becomes business (states and corporations), PC games will become a real war. Quite controversially, there is also a possibility of abuse of army research by the public (drones).

On the other side of the spectrum, some participants do not like the combination of military and civilian resources. They saw it as a conflict of interest. When a research started as civilian, it should not become military at the later stages. Opposite to the first group of the participants, these participants are against any cooperation in this regards, because the others could benefit from it. Funding should be separate; military and civilian research should not be funded together. The military research should not be a priority. The priority should be given to the medical research.

There was also a group of nihilists who said that we do not know what we're actually discussing. There should be no military purposes. What if the findings are misused against humanity? Further development of military and intelligence technologies is unnecessary. The military destructive potential is already sufficient. "They" care only about the money (for research).

Results from Round 2 – Three areas of research

Medicine

The participants discussed mostly about the positive aspects. There was basically no concern about progress in medicine. There are high expectation for human health. People will be more confident about their chances to fully recover from diseases (exoskeletons for people paralyzed after stroke, restored vision and hearing, accelerated treatment of cancer, robotic limbs, increased IQ etc.). Among the benefits there are also more targeted treatments, development of diagnostic tools, improved quality of life (less stress), prolongation of life and also spared resources.

The participants expressed concerns especially related to ethics: exploitation of results, side effects, the relationship of faith and research. They feared particularly the loss of identity and improvements of human body. People will be also eager to take more risks and abuse things. There are also risks of computer failures and software errors. Does not a human become a robot which is controlled by others?

The participants saw negatives in side effects of new drugs and, surprisingly, in prolonged human life which can lead to overpopulation. A long life needs more funding. Moreover, pharmaceutical companies, social and health insurance companies do not want people to definitely cure or prolong their lives for financial and business reasons. In medicine, it's mostly about money. Financial interests dominate research motivation. Medicine is a business. Progress is financed only for progress.

There is also a question what will be the price of new technologies and drugs, especially concerning the fact that all people should have an equal access to them. This is combined with insufficient education. People have poor / bad / no information about new possibilities.

Artificial intelligence (computer learning)

Artificial intelligence would be beneficial for many if it can be used under circumstances not suitable for human beings, e.g. firefighting (the higher price of human who is irreplaceable). So it would mean a more comfortable and safer life, simplification of work (production / factory), better data availability and reduction of car accidents due to human error (autonomous cars). Quantitative data analysis could be used for better predictions in medicine, meteorology and applications to normal life. “Technology is our toy, which brings us joy and fascinates us.” Participants were not afraid of any manipulation if they have their own sense of judgement. They were neither afraid to share information about them.

However, there are some concerns. The machine can only do what a person has programmed into it. When it is necessary to discard the human / emotional element and create a machine independence, this moral dilemma of who is programming it becomes more important. There are questions about a responsibility for actions: human factor versus machine. Participants do not want to give the right to artificial intelligence to replace man. It should help people, not replace it. If the people will be unemployed, who will contribute to the state budget? We are not thinking about the consequences all the time – we have options, but who has the responsibility? Programmer, machine, company, owner?

We should not allow complete autonomy of the machines. The robot must not exceed the man. Moral dilemmas are related to possible misuse in the military field. The robots should not control us.

Nevertheless, they cause us stress and discomfort and they can break down. We should not be dependent on the machine as they may fail. There is a need to resolve incompatibilities of different HW and SW systems. Moreover, there are concerns about protection of personal information and data leaks (hacker attack).

The negative aspect is that computers could learn “the bad things” from people. And that simplified life could negatively affect health conditions of people – see e.g. loss of emotion, loss of human contact and changed relationships. Some participants said that we are now experiencing a negative boom of technologies (consumption, misinformation, manipulation, etc.). What will people do and how will they live? Will we have control over artificial intelligence? What will happen to love? How will be the interpersonal relationships? What values will dominate? What emotions will exist? They say that the smarter the computers are, the more stupid the people will be – we will not need to learn anymore. We may lose our humanity – our children are already living in the virtual world.

Brain-computer interfaces

The health point of view was predominant, especially a potential to help people who are somehow disabled so they can walk again, control their limbs or hear again. The participants also discussed about simulations to better prepare people for different situations or occupations (education). Brain-computer interfaces could improve information processing and shorten the "idea to product" process. We will not learn unnecessary, but only quality information.

The participants expressed concerns about using chips in the brain. What if the connection does harm the brain? There are also moral concerns about this will be tested on humans and animals. Will we become robots? Virtual reality should be used only for a limited time to avoid negative influences (aggression, loss of identity, privacy loss, cyber-bullying, hacking, electromagnetic frequencies etc.). They were afraid if we will not learn anything new, we will worsen our memory so, at the end, the improvement will not be worthwhile. Plus, will the machine know what I want? Will there be a 100% transmission of information? Do we want machines and technology to think for us? Are we becoming only passive users?

It is necessary to take decision on "acceptable limits" – to define the boundaries of identity: what is a person who is a robot. Questions of synchronicity between human and machine. The fear that technology will control the brain. Moreover, there is a dilemma to whom and how to make these "upgrading" technologies available. Negative would be if they are unavailable to ordinary people. A dilemma is whether another humanization of computers is desirable. A question of the influence on decision-making processes concerning people control and behaviour manipulation. A dilemma of marketing versus impact on people. There are concerns about the loss of free thinking. Getting information about ideas can be good for one side and bad for another.

Cross-cutting

During thematic rounds, information on examples of research use was a clue for the participants. The examples mentioned by the moderator were used in the discussion more than the not mentioned ones (but were in the manual). Only a few participants were able to imagine other uses, for example for brain-computer interfaces. For others, the subject was distant and brought only few ideas or ideas to the discussion.

The area that was thematically the easiest to grasp and the participants returned to it was medicine. In cases of brain and medical research, participants were more likely to trust in a professional institution, to cooperate with foreign countries, and not to misuse the results. In the case of artificial intelligence and brain-to-computer interfaces, greater scepticism has emerged, and the purpose of such innovations has often been questioned, or even totally rejected.

The biggest problem was that the questions were many times formulated so that the participants did not know what they were supposed to mean, and then the discussions were harder to start. The discussion was more extensive and fluid when we talked about artificial intelligence and medicine, probably because these areas were better understood by participants and were more specific and closer to them than the other discussed topics. The most important question was whether such research is needed and to whom its results will serve.

There seems to be a tendency to underestimate the negative effects. Positive promotion prevents us from seeing a negative. Positives prevail (we believe in them). We cannot imagine the possible consequences. If we do not try, we will not know. We have to try it, but the possibilities of abuse are huge and unimaginable (especially a loss of privacy). We also feel a loss of the certainty of the world we know – we have to remember numbers, the information is focused on technology, which we do not understand and do not learn them. Left alone risks of non-regulated geopolitical development (social inequalities, power politics, etc.).

Results from Round 3 – Questions to address in the future

1. Is it ethical to communicate with a person in a coma and to obtain information from the brain after death?

   Theme: n/a; **Actors:** citizens; **Number of votes:** 23

2. Is it always a human first?

   Theme: n/a; **Actors:** policy-makers; **Number of votes:** 16

3. How to solve a financial issue so e.g. robotic limbs will be available to ordinary people?

   Theme: n/a; **Actors:** policy-makers; **Number of votes:** 15

4. How is information secured against hackers?

   Theme: n/a; **Actors:** businesses; **Number of votes:** 15

5. Are these surveys and consultation designed for the general public (for citizens) or for economic purposes only?

   Theme: n/a; **Actors:** policy-makers; **Number of votes:** 14

6. Will people / public be informed about the results of HBP? About drugs, inventions, products?

   Theme: n/a; **Actors:** policy-makers; **Number of votes:** 14

7. How can we prevent abuse of research funding?

   Theme: n/a; **Actors:** researchers; **Number of votes:** 13

8. How to guarantee non-use of medicines for military purposes?

   Theme: n/a; **Actors:** policy-makers; **Number of votes:** 13

9. Will artificial intelligence help people in the future?

   Theme: n/a; **Actors:** citizens; **Number of votes:** 13

10. Robot or human? What can I do if I want to remain a free person with my feelings not influenced by computers?

    Theme: n/a; **Actors:** researchers; **Number of votes:** 10

11. Can you identify safety risks?

    Theme: n/a; **Actors:** researchers; **Number of votes:** 10

12. Who decides about the use of technology? Is it for all or for those who need it?

    Theme: n/a; **Actors:** policy-makers, researchers, stakeholders, and citizens; **Number of votes:** 10

13. Are we ready for the future?

    Theme: n/a; **Actors:** stakeholders, businesses, churches, and citizens; **Number of votes:** 10

The questions reflected nicely the discussions we had at the tables. Many of them are about "human first" and ethical aspects of introducing these kind of technologies. They want to remain humans with free thinking. Also, concerns about privacy and date protection were very important for the participants. On the other hand, there are very practical questions about what the artificial intelligence is good for and who is really needing it. And also the ones about financial aspects and funding of new technologies and innovations. The participants were also interested in knowing who decides about the future and if the stakeholders, business, church and citizens are ready for what will come. They felt that they do not have enough information.

Key themes across rounds

Overall, the topic of neuroscience and dual use was difficult to grasp for participants and rather complicated. In the first round, they seemed to have expressed their opinion almost on everything that was relevant to them and what they felt they understood. In other (themed) rounds, their attitude was repeated, and sometimes they came to re-express what was already said.

The participants were welcoming the new technologies which can potentially come up out of the brain research. They discussed lot about positive aspect this could bring. On the other hand, a fear of so called dehumanization and loss of free mind were the most significant concerns. On the practical side, they were concerned about how funding and accessibility of the research results will be done. Some participants were concerned about the current issues of the research funding in Slovakia specifically that our government was unable to fully secure EU funds for research. This fact influenced discussions on different topics and caused that the participants were expressing their scepticism more often.

During the debate there were many concerns-related opinions that could be described as conspiratorial, too:

- Pharmaceutical companies are only pursuing business and not producing effective medicines so they can keep high incomes.
- In medicine, it is all about chemistry and natural treatments are ignored.
- A cancer medicine must definitely exist, but the researchers have not published it because they want to draw on the funds for keep doing cancer research.
- Is the fight against terrorism a real one? Or is it just an excuse for business?
- “Someone is playing with us and big money is being spent.”
- “They already control us.”

The participants were very much concerned with not being informed properly about research and its possible consequences. They feel being seduced by the nice things (with their “eyes glued”) but, in fact, they are not given the proper information. The reason for it, as they see it, can be partly described as a set of individual failures of the authorities in terms of publication of information and suitable regulations.

Demographic profile of participating citizens

Concerning age distribution of the participants, it has to be noted that the Statistical Office of the Slovak Republic (SOSR) uses different age categories when compared to the one used by the project. Anyhow, the participants reflected the general population in Slovakia very well with the only exception of the people 65+. Moreover, there was a light overrepresentation of the groups 18-29 and 50-59 (when using the project age categories).

Gender was represented equally.

In terms of education, there is also a difference in the indicators as the SOSR uses only four levels of education. Given that, we have a very good representation of all three education levels (primary and lower secondary, higher secondary and university level).

As for geographical zone, again, the SOSR uses different indicators than city-town-rural characteristics. The available data relies on the number of inhabitants. Nevertheless, here, also the participants reflected pretty well the population in Slovakia.

Data on the participating citizens:

Age:	Participants confirmed for the workshop	Participants showed up for the workshop	Age (SOSR[1]):	Participants showed up for the workshop (SOSR)	Percentage of the age group compared to the general population
18-29:	8	8 (24%)	18-24	7 (21%)	18-24: 12,35%
30-39:	8	6 (18%)	25-34	5 (15%)	25-34: 20,58%
40-49:	8	7 (21%)	35-44	8 (24%)	35-44: 18,03%
50-59:	11	11 (33%)	45-54	7 (21%)	45-54: 17,39%
60-69:	1	1 (3%)	55-64	6 (18%)	55-64: 16,00%
>70:	0	0	65+	0	65+: 15,65%

[1] Statistical Office of the Slovak Republic (SOSR) uses different age groups distribution. https://slovak.statistics.sk

Gender:	**Participants confirmed for the workshop**	**Participants showed up for the workshop**	**Percentage of the gender group compared to the general population**
Women:	18	17	52%
Men:	18	16	48%
Other:	0	0	N/A

Education	**Participants confirmed for the workshop**	**Participants showed up for the workshop**	**Percentage of the age group compared to the general population**
Primary and lower secondary education:	13	12	44,67%
General upper secondary education :	13	13	37,67%
Vocational Education and Training:	N/A	N/A	N/A
Bachelor or equivalent:	N/A	N/A	N/A
Masters or equivalent:	10	8	17,65%
Doctoral degree or higher:	N/A	N/A	N/A

Geographical zone (percentage of population living in…)**:**	**Participants confirmed for the workshop**	**Participants showed up for the workshop**	**Percentage of the age group compared to the general population**
City (20,000+):	18	15	40%
Town(2,000-20,000):	8	8	30%
Rural (0-2,000):	10	10	30%

Annex 1 – Translated templates from round 1

TABLE 1, Template 1

What do you think about the fact that public research intended for civilian use can be used by the military or intelligence agencies?

- Certainly, they should be linked and used.
- Yes, but under certain conditions, it depends on what purpose (protection, abuse, threats).
- It should be civil and military separated because they have different goals, priority, and focus.
- Military research does not publish data.
- If possible - release from public research only some of the data.
- We need to consider where the results can help and where to abuse.
- It's good when it can profit from military research.
- Good when it's easier to work
- Treatment of civilization diseases - Alzheimer's disease.

Do you find it problematic or reassuring? Please explain (why/why not).

- Problem if data (personal) gets to other organizations.
- Use / abuse in war conflict.
- Ok, if it makes peoples work easier.
- When it's connected, it can be better used.
- The military area may misuse some results.
- It's not okay for everyone to share their research.
- Okay, if they have a common goal, they will save themselves, they will clearly say what to use and what not.
- Put emphasis on research into incurable diseases.

What, if anything, concerns you about the possible use of the research results by the military or intelligence agencies?

- Whether or not there will be war.
- The fact that research has already had the results of treatment, but it does not release them because of pharmaceutical business.
- Public opinion and behaviour oft he entire population may be affected.
- Use of secret weapons.
- Hygienic weapons.
- Concern about the use of chemicals instead of natural ones.
- That robots will change us, technology will dominate, less social contact.
- Common communication is lost, people are becoming artificial.
- People will not work, the robots will (people do different things – they do not know it, they do not have the content).

Does it make a difference if the use of the research by the military or Intelligence agencies is for defence or counter-terrorism purposes?

- It is abuse (as in the United States, martial law) – other states are under the threat of terroism.
- It’s okay if it’s to protect people.
- No, in the case of Slovakia, because it would be misused (as with Prime Minister Mečiar) if there are more developed countries.
- Maybe they do not need more information about people (us), but they should focus more on the research of terrorism.
- It is not a bad way to find out how this behaviour is taking place, to know how it is in Islam, how terrorism affect us.
- The fear that the army will only “play” with it and it will not help us.

TABLE 1, Template 2

As a European funded project, we are not allowed to do military research. However, other research initiatives on the human brain may be funded by defence agencies. It is in general an integrated part of research to collaborate with other researchers in the same field, or at least sharing knowledge and results, in order to move the field/research forward. Should the project collaborate with other brain research initiatives or organisations that work for or receive financial support from defence agencies, e.g. the American "Brain Initiative" or the Chinese "China Brain Project"?

- In the EU we do not have the same standard.
- In Slovakia there is a problem with the use of financial resources (drawing on structural funds).

Please explain why/why not.

- They should work together, they are skilled people, they get better results when they get together, and there is more money.
- It's a fact – the countries are cooperating, it should be like that and we will not change much.
- Collaboration, finance, visibility of Slovakia and our results.

Can an organisation receive funding through the Human Brain Project for their civilian research, if they at the same time do military funded research?

- It is necessary to separate the military and civilian sectors.
- It can if the countries commit themselves to use results for the defence of the population.

Please explain why/why not.

- It is important to control the flows of money and to go for the right purpose.
- Determine the purpose of using the results at the citizen level such as civil control.

TABLE 2, Template 1

What do you think about the fact that public research intended for civilian use can be used by the military or intelligence agencies?

- They will be used anyway, the military area will use it as a priority.
- I do not care, they have nothing to do, and if they want to use it in the army, they will use it.
- I would be worried if the terrorists used it, but on the other hand it could be used as a defence.
- Can be used for both good and bad. It can be used and misused.
- It depends on whoever gets it - or misuses.

Do you find it problematic or reassuring? Please explain (why/why not).

- If the Allied Army OK.
- If in the hands of Islam, abuse.
- If a foreign army or terrorists get this, then our army also needs to have these technologies for defence.
- Important control within the army and research to prevent it from being misused.

What, if anything, concerns you about the possible use of the research results by the military or intelligence agencies?

- Not to abuse it against the ordinary people.
- Not to start the war.
- In order not to reach the black market, into the hands of terrorists.

Does it make a difference if the use of the research by the military or Intelligence agencies is for defence or counter-terrorism purposes?

- If only the defence, OK, but who will guarantee that.
- If it's used to defend, it's okay.
- While it is in defence, a powerful politician can abuse it if he has power ambitions and knows that other armies do not have it.

TABLE 2, Template 2

As a European funded project, we are not allowed to do military research. However, other research initiatives on the human brain may be funded by defence agencies. It is in general an integrated part of research to collaborate with other researchers in the same field, or at least sharing knowledge and results, in order to move the field/research forward. Should the project collaborate with other brain research initiatives or organisations that work for or receive financial support from defence agencies, e.g. the American "Brain Initiative" or the Chinese "China Brain Project"?

- Collaboration is good, more knowledge can be developed.
- In the event of a serious threat from a potential aggressor, cooperation is not good (e.g. Russia, USA).

Please explain why/why not.

- "More heads, more sense".
- The advantage of cooperation gets both sides – the aggressor, but also the defender.
- It is not possible to prevent possible abuse, but it is also beneficial to cooperate.
- We need to choose who we will work with, based on the size of the army.

Can an organisation receive funding through the Human Brain Project for their civilian research, if they at the same time do military funded research?

- In Slovakia yes, because we are not aggressors - it also applies to the whole of Europe.
- If something is created and it remains secret, it is unnecessarily devised, and if it is disclosed, a potential abuser will also get it.

Please explain why/why not.

- Yes, if we join with the army, a greater chance of higher resources, research can be intensified, expanded, accelerated.
- Nonsense discussion, because research is public, and the results are still coming to the army.
- At present the internet cannot hide the results, everyone gets it (if it is public research).
- It must be financially supported, regardless of the fact that it can be misused, because this cannot be avoided.

TABLE 3, Template 1

What do you think about the fact that public research intended for civilian use can be used by the military or intelligence agencies?

- Yes, for the defence. It's a duty. Secret services and defence are relevant. - Public / Army control. - Delay in military and public research (other objectives) and funding.
- Slovakia - a small country, little funding for military research, it has to be funded by powers. - Financing in Slovakia prioritises public interest in the EU / NATO context evenly.
- Confidence in research - transparency.

Do you find it problematic or reassuring? Please explain (why/why not).

- It's easy to use for unknown purposes.
- Scratching the borders of military and commercial use - PC games will become a real war.
- The army becomes business (states and corporations).
- When it comes to informing the public: "They would glue their eyes" by nice things but in reality???

What, if anything, concerns you about the possible use of the research results by the military or intelligence agencies?

- Individual failures (publication of information, regulations). State power abuses. Public scrutiny is needed (means, efficiency).
- We do not know which side we are - Russia vs. USA. We are part the EU. Misuse of army research by the public (drones).
- Ethics of dehumanization / influencing the psyche.

Does it make a difference if the use of the research by the military or Intelligence agencies is for defence or counter-terrorism purposes?

- Not army, but rather secret services will use it. Is the fight against terrorism a real one? Or a business?

TABLE 3, Template 2

As a European funded project, we are not allowed to do military research. However, other research initiatives on the human brain may be funded by defence agencies. It is in general an integrated part of research to collaborate with other researchers in the same field, or at least sharing knowledge and results, in order to move the field/research forward. Should the project collaborate with other brain research initiatives or organisations that work for or receive financial support from defence agencies, e.g. the American "Brain Initiative" or the Chinese "China Brain Project"?

- From the international side, cooperation, mutual assistance, humanitarian, quid pro quo – something for something – under peace treaties. Confidence in professional institutions (MV, MŠ, MO, SAS, Universities, hospitals).

Please explain why/why not.

- Moral duty to cooperate. No - human rights.

Can an organisation receive funding through the Human Brain Project for their civilian research, if they at the same time do military funded research?

- Yes, if it meets ethical and peace goals.

Please explain why/why not.

- N/a.

TABLE 4, Template 1

What do you think about the fact that public research intended for civilian use can be used by the military or intelligence agencies?

- Of course it should not be used for military purposes. But it could be. The feeling that we cannot influence it as citizens.

Do you find it problematic or reassuring? Please explain (why/why not).

- It's not okay. It would not be announced in advance which is a problem.
- Research needs to be publicized and people familiar with it.

What, if anything, concerns you about the possible use of the research results by the military or intelligence agencies?

- The soldiers would be remotely controlled, one would not be able to intervene in it, stop it and restrict it - if it a brain is controlled.

Does it make a difference if the use of the research by the military or Intelligence agencies is for defence or counter-terrorism purposes?

- Not because terrorism is unambiguous. If it was possible to influence the thinking of terrorists, yes. It does not change anything.

TABLE 4, Template 2

As a European funded project, we are not allowed to do military research. However, other research initiatives on the human brain may be funded by defence agencies. It is in general an integrated part of research to collaborate with other researchers in the same field, or at least sharing knowledge and results, in order to move the field/research forward. Should the project collaborate with other brain research initiatives or organisations that work for or receive financial support from defence agencies, e.g. the American "Brain Initiative" or the Chinese "China Brain Project"?

- If it was only in one country, there could be stagnation and isolation as if we were going from scratch.
- It is good to cooperate, but it is necessary to determine the objectives for which research will be used

Please explain why/why not.

- They could cooperate as far as the state institutions are concerned, not the private sector.
- To determine the rules in advance so as not to be misused.
- Collaborate and consult things if the boundaries of research are precisely defined.
- If more people work together, there may be more results.

Can an organisation receive funding through the Human Brain Project for their civilian research, if they at the same time do military funded research?

- Yes, they can negotiate.
- No, they cannot, because it should be separated.

Please explain why/why not.

- Yes: if they have the same opinions and a project. If it was published, people were informed and had access to it.
- No: not to abuse.

TABLE 5, Template 1

What do you think about the fact that public research intended for civilian use can be used by the military or intelligence agencies?

- It should not be allowed for military purposes.
- It should be possible to use it.
- Yes, but with conditions and control of use.
- The question is nonsensical, secret services get to everything.

Do you find it problematic or reassuring? Please explain (why/why not).

- We do not know what we're talking about.
- There should be no "military purposes".

What, if anything, concerns you about the possible use of the research results by the military or intelligence agencies?

- What if the findings are abused against humanity.

Does it make a difference if the use of the research by the military or Intelligence agencies is for defence or counter-terrorism purposes?

- It's a very abstract question.... If so, such research should be specifically targeted.

TABLE 5, Template 2

As a European funded project, we are not allowed to do military research. However, other research initiatives on the human brain may be funded by defence agencies. It is in general an integrated part of research to collaborate with other researchers in the same field, or at least sharing knowledge and results, in order to move the field/research forward. Should the project collaborate with other brain research initiatives or organisations that work for or receive financial support from defence agencies, e.g. the American "Brain Initiative" or the Chinese "China Brain Project"?

- Influencing the activity of soldiers through the brain is unlikely.
- Collaboration is desirable because the US has top-level research.

Please explain why/why not.

- I do not like a combination of military and civilian resources.
- If the army wants to use it, let it be financially involved.
- Yes, cooperation, so that Europe is not lagging behind the US and China where they work together.
- I feel as if someone's been playing with us - big money is poured.

Can an organisation receive funding through the Human Brain Project for their civilian research, if they at the same time do military funded research?

- It's okay, everything can be abused...
- Research that shifts the development of "human race" to better, it is not important who finances it.

Please explain why/why not.

- Further development of military and intelligence technologies is unnecessary. The military destructive potential is sufficient. "They" care only about money (for research).
- Brain research is not a priority. Investing in medicine, human protection, and healthy nutrition.

TABLE 6, Template 1

What do you think about the fact that public research intended for civilian use can be used by the military or intelligence agencies?

- There is money in the war, they will get the results of public research anyway.
- It cannot be avoided, you have to look forward to it, but do not try to avoid it.
- Associated with psychiatric research.
- The concern that it should not be misused. There should be co-operation if it is in the interests of good.
- It's ok but it should not get out (from the SR).

Do you find it problematic or reassuring? Please explain (why/why not).

- Find a border - what is exploitation, what is abuse (manipulation by psychic).
- If it is NASA, for example, it is all right, terrorists not.
- Even in war, they are not clearly good and evil, both sides may think they are good.

What, if anything, concerns you about the possible use of the research results by the military or intelligence agencies?

- Not to be misused for psychic manipulation. Radicalization. Getting and abusing power.

Does it make a difference if the use of the research by the military or Intelligence agencies is for defence or counter-terrorism purposes?

- It would help the citizens - then it would be okay.
- Research will not change anything. They would tell us it is a counter-terrorism, but it will be something else.

TABLE 6, Template 2

As a European funded project, we are not allowed to do military research. However, other research initiatives on the human brain may be funded by defence agencies. It is in general an integrated part of research to collaborate with other researchers in the same field, or at least sharing knowledge and results, in order to move the field/research forward. Should the project collaborate with other brain research initiatives or organisations that work for or receive financial support from defence agencies, e.g. the American "Brain Initiative" or the Chinese "China Brain Project"?

- Those with military funding are at a higher level. If we isolate it, it will be a disadvantage. We need to work together.
- Conflict of interests, if we did start as a civilian research, we should not continue as military one.
- It should stay at home.

Please explain why/why not.

- We are a poor state - whatever we find out, the others would benefit more than us. We are not a rich country. If we do not cooperate with abroad, we would be behind in the knowledge and the financing - Isolation: Slovakia would be in jeopardy.
- When we close the gate, they cannot help us. We have to believe that it will be used for good purposes.

Can an organisation receive funding through the Human Brain Project for their civilian research, if they at the same time do military funded research?

- It does not matter if the organization is well-educated and capable. It should not, but it does not matter.
- Consensus opinions mostly.

Please explain why/why not.

- It depends on the abilities.
- Military research cannot be separated from civilian. Those who think that - it is a nonsense. Military research can be kept secret for at least a while.
- They are interconnected.

Annex 2 – Translated templates from round 2

TABLE 1, Medicine

What are the positive aspects of this development?

- Precisely targeted drugs. Development of a diagnostic program, an information system.
- Civilization diseases and their treatment. It would be important to explore the reduction of stress and disease. Explore the question of why people are sick - genetics research.
- Improved diagnostics will save time for doctors and finance.
- Improvement, simplification of life, comfort.
- Assistance to soldiers.
- Animal welfare.

What are the negative aspects of this development?

- The fear of drug abuse, side effects.
- Abuse by military forces against the population, to instigate conflict.
- It depends on who and the purpose of the research.
- The fear of too much chemistry.

What kind of dilemmas will this development cause?

- It is important that ethics still prevails.
- Protect research and results from misuse.
- Someone may have the problem of combining faith (e.g. soul) and brain research.
- Make results and products help more and harm less (side effects).
- Obey and have a code of ethics.

Do the positive aspects outweigh the negative? Or vice versa?

- Yes, especially because it can improve people's lives and cure diseases.

Are you concerned that this kind of research/development is carried out?

- Abuse of drugs, side effects, abuse of research results.

TABLE 2, Medicine

What are the positive aspects of this development?

- Assistance to people - new drugs - treatment of diseases not yet treated.
- The state is interested in people getting cured as soon as possible, because it costs a lot of money if they are sick.
- Sophisticated models can produce tailor-made medicine.
- Improvement in order to limit negative side effects.

What are the negative aspects of this development?

- Abuse - harm to people.
- Extending life increases the need for limited resources (food, housing, energy).
- Pharmaceutical companies are not interested in definitively curing diseases because they would not have business.
- Social and health insurance companies may not be interested in life-prolonging medicines because they would have to pay for their pensions and treatment for a long time. Even the state does not want to cure definitively, because then the economy will not grow.

What kind of dilemmas will this development cause?

- Permanent treatment vs. one-time treatment.
- Side effects - one thing is cured, another may be triggered.
- Each drug also has a negative side - research takes decades.
- Whether animal research is sufficiently transferable to humans.
- Everyone cannot live for a hundred years, because overpopulation.

Do the positive aspects outweigh the negative? Or vice versa?

- More positives, although side effects can be dangerous - more research needs to be taken into account.
- The local is positive (something quick to improve my illness, the close ones will live longer), but the global is negative, Africa - large population - nutrition issues - prolonging life even greater. The more people, the worse the ecology.

Are you concerned that this kind of research/development is carried out?

- They are not worried, especially to make life longer and better

TABLE 3, Medicine

What are the positive aspects of this development?

- Priorities: diagnosis, therapy, prevention (better preparation e.g. early diagnosis).
- Research of replacement organs (parts of the body, limbs), causality appearance, solution of civilization diseases, healthier life, prolongation of life, improvement of its quality.
- Remote diagnostics, top professionals (effective and quality treatments).
- Enhancement of human (Will we be still people?) - strength / cognition.

What are the negative aspects of this development?

- Medicine is business. - Progress only for progress.
- Progress to the detriment of quality? - Remote diagnostics.
- Influencing the psyche - consequences - uncertain / addictive.
- Cloning. - We do not want to wait / cannot.
- Poor education - People have poor / no / bad information about drugs.

What kind of dilemmas will this development cause?

- Will the public have access to new drugs and technology? The price - everyone has to be able to buy medicine.
- Life saving has a higher price - regardless of religion. Abuse of technology.

Do the positive aspects outweigh the negative? Or vice versa?

- More or less balanced - Pay-outs are more beneficial, but negatives should be tracked.
- To educate the public - the natural aspect of security (state / medicine).

Are you concerned that this kind of research/development is carried out?

- Loss of identity / human improvements.

TABLE 4, Medicine

What are the positive aspects of this development?

- The animals would cease to be used for research.
- Better diagnostics and appliances.
- Better development and efficacy of medicines.
- Increase productivity in study, work.
- Better lives of people with mental disorders.
- More precise use in microsurgery.
- Robotic body part replacement.

What are the negative aspects of this development?

- Medicines will be available for "any stupid thing" and people will use pills unnecessarily.
- The computer system that replaces the animals might not be accurate.
- Dependence could be created. Suppression of emotions in soldiers. Inhumanity.

What kind of dilemmas will this development cause?

- In the case of surgery, it would be better to let human operate because human is human, closer than machine.
- Moral abuse of soldiers, as well as people in general. Misinformation for soldiers - consequence of dependence.

Do the positive aspects outweigh the negative? Or vice versa?

- They are balanced, but it can always be misused.

Are you concerned that this kind of research/development is carried out?

- No worries, soldiers would be inhumane, toxic / drugs, fear of abuse.

TABLE 5, Medicine

What are the positive aspects of this development?

- High expectations for human health. Robotic limbs. Increasing IQ. No promises of mental benefits from brain research so far.

What are the negative aspects of this development?

- Risks of computer failure – software errors. Tools for controlling people.

What kind of dilemmas will this development cause?

- Does not a human become robot = controlled by others? Financial interests dominate the motivation of research.

Do the positive aspects outweigh the negative? Or vice versa?

- Effects are balanced.

Are you concerned that this kind of research/development is carried out?

- "They control us already."

TABLE 6, Medicine

What are the positive aspects of this development?

- Finding a drug, technology. Improving quality of life, prolonging active life.
- Treatment of cancer, loss of vision, hearing, paralysis, acceleration of treatment.
- Social impact - enhancement of the environment, not only rapid cure, but e.g. that artificial intelligence could care for the sick.
- Technology will be more advanced and will better diagnose the symptoms - even faster.

What are the negative aspects of this development?

- Psychodrama drugs - they could be misused. Underestimation of adverse effects for the purpose of drug sales.
- We are not ready to prolong life.
- Use in the army - Soldier stimulation + technique.

What kind of dilemmas will this development cause?

- Even what seems immoral and unethical to us can bring valuable results (see World War II - Mengele).
- Availability of treatment / greater gamblers.
- Compassion, playing on the sentiment prevents us from seeing a negative.
- Technology vs. replacement of human factor.

Do the positive aspects outweigh the negative? Or vice versa?

- Positives prevail, one is more confident that he will receive treatment.

Are you concerned that this kind of research/development is carried out?

- The social aspects - are we ready to extend our life?
- Military purposes.

TABLE 1, Artificial Intelligence

What are the positive aspects of this development?

- Cars OK - For better security as a device, which highlights the human error.
- Better diagnostics in medicine.
- Can the robot report on human errors (diagnostics, science, weather forecasting, disaster prevention, flight dispatching)?
- Technology to help to make life safer.
- Use robots where there is a danger to humans or where human factors may fail.

What are the negative aspects of this development?

- Robots are not OK - they would replace us, they may fail, they cannot evaluate (diagnose) as a human.
- People will not have a job.
- Simplifying life brings a risk of health problems.
- Everything will be artificial, nature will be lost.
- Totally autonomous cars do not exist.

What kind of dilemmas will this development cause?

- To use the results correctly.
- Do not abuse in the military.
- Human has to be the supervisor over technology – to be the one who controls it.
- Not to place robots where it is important to keep a human factor (e.g. in medicine during surgery).
- Robots should help us - not replace us.

Do the positive aspects outweigh the negative? Or vice versa?

- In the civil sector, ok. Where people fail.
- Progress - these are more positives than negatives.
- People will change due to progress - perceived both as natural development and a fear.
- You do not have to rely too much on technology.
- It depends on progress, and the view of the robotics role can change.

Are you concerned that this kind of research/development is carried out?

- Robots will replace us and people will not be needed - to prevent the loss of humanity.
- Robots - bad assessment of the situation - badly programmed moral barriers and this is a risk to the military area (as well in education, work, free time, relationships).
- They can be hacked.

TABLE 2, Artificial Intelligence

What are the positive aspects of this development?

- Human assistance - if it focuses on a specific area, the error rate will be reduced.
- Knowing where the closest person is is a plus.
- Personalized ads are a plus (e.g., an offer of nearby restaurants).
- Quantum computers - much higher than today's computers - positives in many areas (medicine, space research).
- In the future, help with surgery can be solved.

What are the negative aspects of this development?

- Worried about spying. Quantum computers multiply negative effects (e.g. internet security vs hacking).
- Autonomous traffic - possibility of error, failure.
- If I am replaced with computer, I will not live anymore, the computer will. People are not talking to each other today - everybody is reading their cell phone.

What kind of dilemmas will this development cause?

- What will people do? How will they live? What will they live from?
- Whether a person always has control over the computer.
- Whether or not a few specialists control the rest of the world.
- What brings interaction between machines - collaboration vs. fight – Will people get involved in it?

Do the positive aspects outweigh the negative? Or vice versa?

- There are more positive aspects (time, energy, stress reduction, health, and diagnostics). A balanced match.

Are you concerned that this kind of research/development is carried out?

- No – We can always switch off the computer.
- Yes, if abused - the computer uprising against the people (Asimov - the necessity of rules to prevent it).
- The smartest the computers are, the more stupid people will be (they will not learn).
- We will lose humanity - children are already living in the virtual world.

TABLE 3, Artificial Intelligence

What are the positive aspects of this development?

- Dissemination of information / better data.
- Autonomous cars - Reduction of accidents due to human error.
- Simplification of work (production / factory), streamlining / improving quality of life.
- Technology is our toy, brings joy and fascinates us

What are the negative aspects of this development?

- Spreading misinformation. We rely on the technique and it can spoil us - it has got mistakes.
- Robots will replace us - employment. The robot must not exceed the man. Loss of emotion. Not thinking about the consequences - we have the options, but who has the responsibility? (Programmer, machine, company, owner?)

What kind of dilemmas will this development cause?

- Who and where will be financed - unemployment - who contributes to the budget?
- Who is responsible for? - Security in the hands of whom? Leaks / misuse.

Do the positive aspects outweigh the negative? Or vice versa?

- Positives prevail but cause us stress, spoil, loss of human contact, change of relationships.

Are you concerned that this kind of research/development is carried out?

- Data leaks (hacker attack). Personal information. Dependence on technology (which may fail). Occupation.
- Loss of the certainty of the world we know - we do not remember the numbers, the information is focused on technology, we do not understand / we do not learn them.

TABLE 4, Artificial Intelligence

What are the positive aspects of this development?

- Simplifying life. Better predictability. Better identification of the disease. Increased speed of work. Better anticipation, threat detection. Robotic operations - the best solution, the computer does not make an emotional decision. Shared information against terrorism.

What are the negative aspects of this development?

- Computer will take control of itself. People will be second. They know everything about us and they can easily get information. They take our privacy – marketing.

What kind of dilemmas will this development cause?

- Marketing bullying, we are being watched. Loss of privacy. Robots will take care of people, replace them.

Do the positive aspects outweigh the negative? Or vice versa?

- Positives will dominate - people perceive it as an improvement of life.

Are you concerned that this kind of research/development is carried out?

- There is always an idea of abuse against a person. Robots will replace humans at work. Computers would learn the bad from people.

TABLE 5, Artificial Intelligence

What are the positive aspects of this development?

- Helping people (not replace them). In transport. Assistance to the disabled.
- Troubleshooting the incompatibilities of different HW and SW systems.

What are the negative aspects of this development?

- What happens to love? What to interpersonal relationships? What values will dominate? What emotions will exist?

What kind of dilemmas will this development cause?

- What will people do then?

Do the positive aspects outweigh the negative? Or vice versa?

- No (?!). We are now experiencing a negative technology boom (consumption, manipulation ...).

Are you concerned that this kind of research/development is carried out?

- Yes - the robots will replace us.

TABLE 6, Artificial Intelligence

What are the positive aspects of this development?

- Use in extreme situations when it is about human life - fires, police interventions.
- Quantitative data analysis and prediction - medicine, meteorology.
- When it is necessary to discard human / emotional factor.

What are the negative aspects of this development?

- People can abuse it - theft, war. Army of machines. Dependence on machines. Use of cyber-crime.
- With any good purpose, a technology may fail.

What kind of dilemmas will this development cause?

- Who is responsible for the acts of artificial intelligence? Person or machine alone?
- How to increase the morale of people who program these machines? - Does artificial intelligence do what a person has programmed it to do? (Dependence on human factor).
- What will be the experience? How will they evaluate them?
- Do not give the right to artificial intelligence to replace people.

Do the positive aspects outweigh the negative? Or vice versa?

- 50/50 with the decisive role of human factor.

Are you concerned that this kind of research/development is carried out?

- The machines can programme themselves and behave as they want.
- Rise of machines - elimination of human factor as a risk.

TABLE 1, Brain-computer interfaces

What are the positive aspects of this development?

- Replacement of the limb.
- Improve the functioning of disabled people (such as Stephen Hawking).
- Use in the treatment of mental illness.
- Supporting organs, exoskeleton, carrying loads.
- Nanotechnology - Body repairing by mini robots.
- Improving learning - receiving, processing information.
- An application that warns you of heart attacks or other hazards (such as insulin dg, for example).

What are the negative aspects of this development?

- Ensure that the brain-computer interface does not hurt and is received by the body.
- It may happen that the body does not accept the interconnection (in medicine) and there are also other surgical procedures.
- Tests are carried out on animals. Risk of human testing - limit, increase safety.

What kind of dilemmas will this development cause?

- Be careful when being used (misused) by the army.
- Allow sick people to have paid for the "upgrades", not only those who have the money.
- The idea that brain-computer interfaces will not be permitted for healthy people.
- The benefit of wider use would be data and enhanced technology.

Do the positive aspects outweigh the negative? Or vice versa?

- The positives dominate.

Are you concerned that this kind of research/development is carried out?

- The fear that a computer connected to the brain will begin to control a person.
- Compatibility of the human brain and the computer must be solved.
- Concerns about new technologies being explored (on animals).

TABLE 2, Brain-computer interfaces

What are the positive aspects of this development?

- Progress in medicine (flaccid muscles, bionic limbs, rehabilitation, and diagnostics) and education.

What are the negative aspects of this development?

- The technical problem – to prevent something we do not want to happen (I will want to give someone a slap and my bionic limbs will do it even though I just wanted it to do it but not really do it).
- High price (for exoskeleton).
- Chaos - chips in the brain - we'll know about others what they think.

What kind of dilemmas will this development cause?

- Is the next humanization of computers wished? (Will not a computer take our girlfriends/boyfriends out instead of us? Will not a computer want to stay on medical leave while we have to work?)
- Where are the boundaries between the correct and incorrect brain-computer interface?

Do the positive aspects outweigh the negative? Or vice versa?

- Positive: Suppressing negative ideas, keeping important information.
- Negative: The ability to crash into people's ideas.

Are you concerned that this kind of research/development is carried out?

- No - progress will come gradually - people will adapt.
- Yes - chaos - the problem to explain.
- Such research is definitely already going on.

TABLE 3, Brain-computer interfaces

What are the positive aspects of this development?

- Healthcare - Handicapped - Movement, Diagnostics, Evaluation.
- Criminology - Detector of lies - revealing personalities (plus and minus).
- Improved brain function - information processing, better quality, but also aggression.
- Reducing the "idea - product" process.
- We will not learn unnecessary, but good things.
- Synchronicity human / pc.
- Better localization - technology is not a limited resource.

What are the negative aspects of this development?

- Cyber-bullying / influencing the brain.
- Negative health consequences (harmfulness, magnetism).
- Abuse (hacking / aggression).
- We will not learn anything (worsen memory) - Enhancement is not worth it.

What kind of dilemmas will this development cause?

- Will the machine know how I want it? 100% transmission? Do we want machines / technology to think for us? We will be users.

Do the positive aspects outweigh the negative? Or vice versa?

- Positives prevail (we believe in them). We cannot imagine the possible consequences.

Are you concerned that this kind of research/development is carried out?

- There is a need to go for it, but the possibilities of abuse are enormous and unimaginable.
- The internet of things / what is connected to what? Chipping / Restriction - Privacy Loss? We do not try, we do not know.

TABLE 4, Brain-computer interfaces

What are the positive aspects of this development?

- Civil use. Replacement of the limbs. Help with handicaps in ordinary life (blindness, deafness). Communicating with people who are affected. People's backward thoughts, communicating with people in coma, and so on. Computer simulations - pilots and the like (doctors). Connecting two people using a computer (their brains).

What are the negative aspects of this development?

- Reading people minds. Finance - accessibility for a wide range of people

What kind of dilemmas will this development cause?

- People will not be able to express themselves.

Do the positive aspects outweigh the negative? Or vice versa?

- Positive impressions, education and help for people.

Are you concerned that this kind of research/development is carried out?

- Controlling people's ideas.

TABLE 5, Brain-computer interfaces

What are the positive aspects of this development?

- Values: health +, social relations -, tolerance +.

What are the negative aspects of this development?

- Reading peoples mind (horror?).

What kind of dilemmas will this development cause?

- Risks of geopolitical development (not regulated, social inequalities, power politics).
- It is necessary to institutionalize the decision on "acceptable borders".
- Define the boundaries of identity: what is a person, a robot.

Do the positive aspects outweigh the negative? Or vice versa?

- No (?)

Are you concerned that this kind of research/development is carried out?

- N/a

TABLE 6, Brain-computer interfaces

What are the positive aspects of this development?

- Nerve revival, walking, hearing. Virtual reality - possibility of simulation of activities (e.g. soldiers). Brain training - memory, attention (plus learning). Fun function - computer games without remotes.

What are the negative aspects of this development?

- We're becoming more like robots. Chip in the head - getting information about that person's ideas. Loss of personality identity. Restriction of freedom. Manipulation of behaviour. Reaction of the link to thinking (e.g. damping). Gaming business

What kind of dilemmas will this development cause?

- To use the machines in moral way. Who manipulates and who is manipulated? Permanence vs. possibility to disconnect. Marketing vs. impact on people.

Do the positive aspects outweigh the negative? Or vice versa?

- Negatives dominate - in terms of freedom and dignity. Positive is just medical help. Positive if used for doing good things.

Are you concerned that this kind of research/development is carried out?

- Loss of free thinking. Manipulation of behaviour. Persecution. Governments could do that to the people.

Annex 3 – Translated templates from round 3

TABLE 1, Template 6

Themes suggested by the group	Policy-makers	Researchers	Stakeholders	Citizens
	Why did not our politicians use the EU money properly for scientific purposes? 7	How to avoid computers taking over humans? 7	*(For businesses) How is information secured against hackers? 15	
	When will our lifestyle improve? 6	Do you think it is a right approach to use brain research in the army where it can be misused? 7		
	When you had the opportunity to use funding from the European Funds why did not you do it properly? 2	Why is there no cure for cancer? 5 Whether it is possible to determine patient health by linking the brain to the computer? 4		
	Why are politicians so selfish and terrible? Why do not they use money for research?	Can we expect a cure for cancer in the near future? But such a cure that cures completely and not just stops or stabilizes the disease? 3		
		Will the funds be used for brain research only? 1		
		Where will we be in 20 years? 1		

TABLE 2, Template 6

Themes suggested by the group	Policy-makers	Researchers	Stakeholders	Citizens
	Are these surveys and consultation designed for the general public (for citizens) or for economic purposes only? 14	Are these surveys and consultation designed for the general public (for citizens) or for economic purposes only? 14		Will artificial intelligence help people in the future? 13
	How abou the access to army research? 6	How can we prevent abuse of research funding? 13		Whether is it absolutely necessary to have everything computer-controlled? 5
	Would you finance the project in medicine or in education? 3	Will there be advances in medicine if the brain is connected with a computer? 1		
	How will we manage money when robots will perform many of our current jobs? 2	To what extent and with what biotechnology should the humanization of machines and / or robotization of humans occur? 1		

TABLE 3, Template 6

Themes suggested by the group	Policy-makers	Researchers	Stakeholders	Citizens
	Will people / public be informed about the results of HBP? About drugs, inventions, producs? 14	Can you identify safety risks? 10		
	Who will control the safety and consequences of such a (brain-computer) link? 6	Are there some limits for human-centred research not to be abused? 8		
	What about a better funding for international research? And better dissemination to the public? 4	Should people be afraid of robots? 6		
	Should people be afraid of keeping their jobs? What will they do? 4	Are not humans forgotten in the research? Dot not you think about improving that? 5		
	What kind of money is the research fundet from? Our public or private? 2 Who really decides on priorities? How can everyone participate? 1	Who really decides on priorities? How can everyone participate? 1		
	How do insurance companies and businesses participate financially?			

TABLE 4, Template 6

Themes suggested by the group	Policy-makers	Researchers	Stakeholders	Citizens
	How to solve a financial issue so e.g. robotic limbs will be available to ordinary people? 15		(Church): Would the church agree with brain-computer interface? 3	Is it ethical to communicate with a person in a come and to obtain information from the brain after death? 23
	How to guarantee non-use of medicines for military purposes? 13			
	How to deal with the current topic of terrorism? 8			

TABLE 5, Template 6

Themes suggested by the group	Policy-makers	Researchers	Stakeholders	Citizens
	Is it always a human first? 16	Robot or human? What can I do if I want to remain a free person with my feelings not influenced by computers? 10	What about contacts with extra-terrestrial civilizations and opening of debate in this field? 6	
	Will you prevent compulsory brain-chips? 9	How can you prevent abuse of reading minds? 7	Who will sell drugs? How will the pharmaceutical companies make profit when they will not have medical representatives who will not "pay" doctors and pharmacists?	
	Will unemployment increase when computers will work for us? 2	How should be the computer connected to our brains? 3		
	Do you plan to allocate more funds? 1	Do you think about whether all these advances will hurt people more than they will help them? 3		
		Will humanity be always at the first place? 1		
		Can you give people more information?		

TABLE 6, Template 6

Themes suggested by the group	Policy-makers	Researchers	Stakeholders	Citizens
	Who decides about the use of technology? Is it for all or for those who need it?* 10	Who decides about the use of technology? Is it for all or for those who need it?* 10	Who decides about the use of technology? Is it for all or for those who need it?* 10	Who decides about the use of technology? Is it for all or for those who need it?* 10
	Is there enough production resources? 4	Who will be responsible for failures? 9	(Businesses, churches): Are we ready for the future? 10	Are we ready for the future? 10
	Are these now technologies a way to improve our lives or a way to gain more power and money by the chosen people? 6	(Are these now technologies a way to improve our lives or a way to gain more power and money by the chosen people?) 6	(Are these now technologies a way to improve our lives or a way to gain more power and money by the chosen people?) 6	(Are these now technologies a way to improve our lives or a way to gain more power and money by the chosen people?) 6
	Do you know how to design social system to guarantee quality of people's life when we will liv longer (pensions, care, etc.)? 6 Do you address security, personality, social aspects and freedoms? 4	(Do you know how to design social system to guarantee quality of people's life when we will liv longer (pensions, care, etc.)?) 6 (Do you address security, personality, social aspects and freedoms?) 4	(Do you know how to design social system to guarantee quality of people's life when we will liv longer (pensions, care, etc.)?) 6 (Do you address security, personality, social aspects and freedoms?) 4	(Do you know how to design social system to guarantee quality of people's life when we will liv longer (pensions, care, etc.)?) 6 (Do you address security, personality, social aspects and freedoms?) 4
	Is not it profitable only for a certain big group of people? 4 Against whom does everyone want to fight? 4	(Is not it profitable only for a certain big group of people?) 4 (Against whom does everyone want to fight?) 4	(Is not it profitable only for a certain big group of people?) 4 (Against whom does everyone want to fight?) 4	(Is not it profitable only for a certain big group of people?) 4 (Against whom does everyone want to fight?) 4
	Do you think it is necessary for our life? 3 Who is actually the right person or institution that decides on our (human) future direction? Is it government? Scientists? The army? 2	(Do you think it is necessary for our life?) 3 Who is actually the right person or institution that decides on our (human) future direction? Is it government? Scientists? The army? 2	(Do you think it is necessary for our life?) 3 Who is actually the right person or institution that decides on our (human) future direction? Is it government? Scientists? The army? 2	(Do you think it is necessary for our life?) 3 Who is actually the right person or institution that decides on our (human) future direction? Is it government? Scientists? The army? 2

Annex 4 – Results from morning survey

QUESTIONNAIRE ON NEUROSCIENCE AND DUAL USE

(mark the answers that you agree with the most with an X)

1) Does it make you concerned that the research from the Human Brain Project could be used by others for political, security, intelligence and military purposes? *(choose one option)*

Not concerned at all	Slightly concerned	Moderately concerned	Somewhat concerned	Extremely concerned
13	*10*	*6*	*3*	*0*

2) If publicly funded research has dual use potential, should it then be allowed? *(choose one option)*

a. Yes	*17*
b. No	*5*
c. I don't know/do not wish to answer	*11*

3) As a European funded project, we are not allowed to do military research. However, other research initiatives on the human brain may be funded by defence agencies. Should the project collaborate with other brain research initiatives or organisations that work for or receive financial support from defence agencies e.g. the American *"Brain Initiative"* or the Chinese *"China Brain Project"*? *(choose one option)*

a. Yes, the most important thing is to make progress in the research.	*13*
b. Yes, but only if it is based in another EU member state.	*1*
c. Yes, but only if it is based in an allied country of the European Union	*2*
d. Yes, but only initiatives or organisations in countries, who have signed and ratified international treaties on e.g. chemical or biological weapons	*8*
e. No, the research project should not collaborate with initiatives or organisations funded by military or defence agencies.	*6*
f. I don't know/do not wish to answer	*3*

4) The European Commission has a big focus on open science, where research data and analyses are public for everyone. Should this also be the case with research that could have dual use potential? (*choose one option)*

a. Yes	*14*
b. No	*10*
c. I don't know/do not wish to answer	*9*

Annex 5 – Results from afternoon survey

QUESTIONNAIRE ON NEUROSCIENCE AND DUAL USE

(mark the answers that you agree with the most with an X)

1) Does it make you concerned that the research from the Human Brain Project could be used by others for political, security, intelligence and military purposes? *(choose one option)*

Not concerned at all	Slightly concerned	Moderately concerned	Somewhat concerned	Extremely concerned
5	*16*	*8*	*4*	*0*

2) If publicly funded research has dual use potential, should it then be allowed? *(choose one option)*

a. Yes	*21*
b. No	*8*
c. I don't know/do not wish to answer	*4*

3) As a European funded project, we are not allowed to do military research. However, other research initiatives on the human brain may be funded by defence agencies. Should the project collaborate with other brain research initiatives or organisations that work for or receive financial support from defence agencies e.g. the American *"Brain Initiative"* or the Chinese *"China Brain Project"*? *(choose one option)*

a. Yes, the most important thing is to make progress in the research.	*14*
b. Yes, but only if it is based in another EU member state.	*1*
c. Yes, but only if it is based in an allied country of the European Union	*1*
d. Yes, but only initiatives or organisations in countries, who have signed and ratified international treaties on e.g. chemical or biological weapons	*13*
e. No, the research project should not collaborate with initiatives or organisations funded by military or defence agencies.	*3*
f. I don't know/do not wish to answer	*1*

Note: One of the participants chose more than one option (b, c, d and e), therefore the total is higher than the number of participants (29).

4) The European Commission has a big focus on open science, where research data and analyses are public for everyone. Should this also be the case with research that could have dual use potential? (*choose one option)*

a. Yes	*12*
b. No	*13*
c. I don't know/do not wish to answer	*8*