Una.Futura
Concept Book

Edited by Mateusz Lewandowski

Freie Universität Berlin
Alma Mater Studiorum Universitá di Bologna
The University of Edinburgh
Helsingin yliopisto
Uniwersytet Jagielloński w Krakowie
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Content

Foreword

Emily Palmer

Secretary-General Una Europa

At Una Europa we were delighted to host the Una.Futura open innovation design hackathon over the summer of 2021, offering our students a unique opportunity to jointly tackle real-life challenges arising from the digital revolution. Led by Jagiellonian University in Krakow, 17 cross-European teams of 70 students - guided by experts and facilitators – focused on finding solutions to six key challenges: digital empowerment, digital citizenship, digital economy, augmented human, cyber threats and mental wellbeing and social relations in the digital world. The creativity and outcomes of their work are to be highly commended!

Initiated in response to the Covid-19 pandemic in early 2020, Una Europa open design challenges have become one of Una Europa's flagship joint innovative formats for education. Not only do they foster challenge-based learning and stimulate peer-to-peer learning, they also drive virtual mobility, facilitate a multidisciplinary approach and involve local communities in the education practice. They are key to Una Europa's commitment to support the graduates for the future develop European common values, as well as intercultural awareness, problem solving and critical thinking, entrepreneurial skills and civic and global skills.

We are already looking forward to the next Una Europa open design hackathon, which will be led by the University of Helsinki in May 2022 and will focus on the challenge delivering the core European value of being united in diversity. Students will have the opportunity to get to know each other, learn more about each other's' cultures and languages and explore how we can make a more inclusive and open Una Europa community.

Dr Mateusz Lewandowski

Una.Futura Coordinator

Developing the university of the future within Una Europa community is an alluring idea. Imagining that students, PhD candidates and academic experts could co-create together in cross-university teams in response to crucial digital challenges, motivated us to make it happen, and to contribute to the idea of the university of the future in this way. We organized the Una Futura, an open innovation design process aimed at developing solutions to address real-life challenges arising from the digital revolution. When we sent out the public call, I was thrilled and asked myself: How will people respond? How much will the teams actually integrate? What will they come up with? Will they be satisfied with what they learn through the whole process? The response of the community was incredible. It showed, that in Una Europa we are not only eager to cooperate, but also that through co-creation we can deliver great and inspiring results. I am sure that everyone involved could take quite a lot from this experience, as I did, and as did the students, academics and people behind the scenes who I talked to after the project. Working on Una Futura was a great adventure and gave the taste what the future of academia may look like.

Introduction

In the last decade, people all over the world have experienced an unprecedented and extensive growth of digital dimensions in all aspects of everyday life, including such areas as education, work, social relations, communication, health and many others. This has brought numerous benefits, but also revealed various threats. Una Europa, an alliance of: Freie Universität Berlin, Università di Bologna, The University of Edinburgh, Helsingin Yliopisto, Uniwersytet Jagielloński, Krakow, KU Leuven, Universidad Complutensede Madrid, Université Paris 1Panthéon-Sorbonne decided to run the Una.Futura project in order to come up with ideas to tackle these issues.

Una.Futura was an open innovation design process aimed at developing solutions to address real-life challenges arising from the digital revolution. In particular, Una.Futura addressed the challenge: how might we improve the benefits and mitigate the risks of our digital future based on previous experiences, in the following challenge areas:

1. How might we enhance digital empowerment?
2. How might we foster digital citizenship?
3. How might we boost the digital economy?
4. How might we embrace the augmented human?
5. How might we mitigate cyber threats?
6. How might we improve mental well-being and social relations in the digital world?

The main goals achieved of this project were twofold. The first goal was to foster the integration of the Una Europa community, and to improve students' and staffs' skills of cooperation in a cross-university multinational environment. Therefore, we teamed up students representing different levels (Bachelor, Master and PhD levels), disciplines (for example philology and engineering), and partner universities. As a result, 17 multinational teams worked together for 3 weeks. They were guided by 25 facilitators and co-facilitators from partner universities, and they were introduced to the problem areas by 16 experts. The second goal of the project was to find solution concepts for the six digital challenges indicated above. As a result of the creative process 17 solution concepts were formulated, and then pitched on the last day of Una.Futura.

The main purpose of this book is to present the concepts. We hope that it may inspire others to take up these ideas for further development.

The challenge sections of this Concept Book are organized according to the concept of the problem-solution spaces[1]. Therefore, the first part of each section presents the experts' view on selected dimensions of the challenge. This embraces the basic definitions of the problems, formulations of the needs and indications of target audiences, as well as sources of data for further exploration. The second part of each section outlines most of the solution concepts. However, some teams decided not to disclose their ideas, and others were willing to continue their work, considering refinement of the concept and applying for funding on Kickstarter or elsewhere. In all such cases we respected the teams' decision, so not all the concepts are presented in the Concept Book.

We wish to acknowledge, that Una.Futura initiative builds on UNA.TEN (Transform Emergency Now! 10 days for change), Una Europa's cross-European student hackathon held in April/ May 2020 which addressed COVID19 post emergency challenges. Una.Futura was coordinated by: the Jagiellonian University (JU) Una Europa Office, JU Academic Entrepreneurship Incubator, and representative from the JU Public Futures Lab, Faculty of Management and Social Communication, Faculty of Law and Administration, Faculty of International and Political Studies and supported by staff from all Una Europa partner universities. Una.Futura was an element of the DIGITALIZED! project which was financed by the Polish National Agency for Academic Exchange as part of the Academic International Partnerships programme and the Excellence Initiative – Research University programme financed by the Polish Ministry of Science and Higher Education.

1 Dorst, N., Cross, N., (2001), Creativity in the design process: co-evolution of problem–solution, Design Studies 22(5), 425-437.

Enhancing digital empowerment

1

1. 1. Problem space

Digital competencies & inequalities

Dr Małgorzata Kułakowska, Uniwersytet Jagielloński w Krakowie

Introduction to the problem

While affecting millions of students, learners and educators worldwide, the Covid-19 pandemic not only brought to light the significance of digital competencies, but it also revealed deep inequalities. Inequalities and divides were easy to identify in terms of access to internet infrastructure, but they were more complex to identify in terms of digital literacy and self-directed learning skills. Furthermore, the pandemic exacerbated already existing inequalities regarding access to resources, job and financial insecurities, and finally gender and ethnic divisions. The focus of the project would be placed on designing support communities and safe spaces by means of which learners would be able to provide assistance to each other.

The most important objectives

- To identify and recognize individual struggles that hinder the development of digital skills and block access to digital education.
- To create online support communities, where people can share their experiences and learn from each other.
- To create a database of (self)learning and teaching best practices.
- To apply student-centred learning strategies towards the development of critical literacy skills.

Audiences and expected value

The significance of challenges outlined above will not cease with the pandemic. However, the current crisis might indeed create the opportunity to re-construct and re-imagine ways of sharing and

disseminating knowledge. As globalization processes keep reshaping local economies, the figures of virtual migrants or digital nomads might receive more attention in the following years. In that light, unleashing the potential of learners and educators to fully profit from digitally accessible resources in order to develop their skills might have a transformative power. As a result, the project might prove interesting not only in the context of education but also for international labour markets.

Known major constraints

The differences in access to internet infrastructure (limits on speed and quality of connection, access to devices, etc), job-related insecurity or family obligations will impose a serious constraint on the learning capacities. However, more flexible and learner-oriented educational styles might help overcome at least some of the limitations mentioned above.

Recommended sources of data

• Bozkurt, A., Jung, I., Xiao, J., Vladimirschi, V., Schuwer, R., Egorov, G., Lambert, S., Al-Freih, M., Pete, J., Don Olcott, J., Rodes, V., Aranciaga, I., Bali, M., Alvarez, A.J., Roberts, J., Pazurek, A., Raffaghelli, J.E., Panagiotou, N., Coëtlogon, P. de, Shahadu, S., Brown, M., Asino, T.I., Tumwesige, J., Reyes, T.R., Ipenza, E.B., Ossiannilsson, E., Bond, M., Belhamel, K., Irvine, V., Sharma, R.C., Adam, T., Janssen, B., Sklyarova, T., Olcott, N., Ambrosino, A., Lazou, C., Mocquet, B., Mano, M. & Paskevicius, M. (2020). A global outlook to the interruption of education due to COVID-19 pandemic: Navigating in a time of uncertainty and crisis. Asian Journal of Distance Education. [Online]. 15 (1). p.pp. 1–126. Available from: *http://asianjde.org/ojs/index.php/AsianJDE/article/view/462*. [Accessed: 27 March 2021].

• Corbera, E., Anguelovski, I., Honey-Rosés, J. & Ruiz-Mallén, I. (2020). Academia in the Time of COVID-19: Towards an Ethics of Care. Planning Theory & Practice. 21. p.pp. 1–9.

• World Bank Edtech Team (2020). Remote Learning, EdTech & COVID-19. [Online]. 15 July 2020. World Bank. Available from: *https://www.worldbank.org/en/topic/edutech/brief/edtech-covid-19*. [Accessed: 21 June 2021].

Digital competencies

Prof. Beatriz De La Riva, Universidad Complutense de Madrid

Introduction to the problem

The global pandemic caused by Covid-19 has accelerated the processes of Digital Transformation (DT) that had been initiated by different organisations. These processes involve public administration, private companies and educational institutions. Before the onset of the pandemic, when these entities were asked about their opinions on what DT was, they tended to answer that Digital Transformation was just about having a website. At the beginning of the pandemic, the idea of DT concerned basically teleworking. Today, different organisations have learned to regard DT as the opportunity to control all processes from their sofa at home.
Taking into account these premises, we will try to understand what Digital Transformation actually means, how it affects different organizations and what competencies must be acquired to position themselves in a scenario of full virtualization.

The main problem(s) explained

The main problem that is faced when undertaking Digital Transformation is that most people involved in these processes lack sufficient digital skills. Furthermore, it appears that in reality these people are not clear about their needs, and therefore on many occasions they implement different technologies without having set their goals.

People and organisations need to stop in order to reflect, and then sequentially to define roadmaps, and implement tools and applications that would solve real problems. These actions should be performed simultaneously fulfilling three basic premises:

- Make the tool fit a person but not the other way around.
- Make the learning curve as flat as possible.
- Interact with other tools.

The most important objectives

1. Define Digital Transformation.
2. Understand the Implications of Teleworking in the Reality of DT.
3. Make a Proposal for Transversal Basic Digital Competencies.
4. Understand the Global Implications of Acquiring Digital Competencies in a Trending World towards virtualization.
5. Develop a value proposition that establishes the priority lines of action of different organizations in a way that it adapts to a situation and would serve as a real help.

Audiences and expected value

Any person is required to help those who need it. People are part of organisations. Whether public companies, private companies or educational institutions, everyone needs guidance to learn and understand that digital skills are already part of work today and they can only accompany people to work efficiently.
As an added value, Una Europa representatives need to guide people and institutions to progress and to operate efficiently, which will make them feel indispensable. Such an approach should lead to an attitude of “never give up”.

Known major constraints

Time: Everyone operates at high speed, therefore if organisations do not acquire the necessary skills fast enough they will fall behind.
Money: Investments can become really expensive.
Ignorance: the world is changing fast and some entities feel lost, as they do not even know where the starting point is.

Recommended sources of data

- The Digital Transformation in Europe: *https://digital-strategy.ec.europa.eu/en/library/shaping-digital-transformation-europe*
- Digital Transformation reports: *https://reports.weforum.org/digital-transformation/*
- Survey: *https://www2.deloitte.com/us/en/insights/topics/digital-transformation/digital-transformation-survey.html*
- Business model innovation: *https://www.emerald.com/insight/content/doi/10.1108/EJIM-11-2020-0443/full/html*

1. 2. Solution space

GEO – Global Education Online

- **Team:** Morgana Bettega (Uniwersytet Jagielloński w Krakowie), Nadia Gubernat (Uniwersytet Jagielloński w Krakowie), Arfaat Ahmed Peer Iftequar (KU Leuven), Zineb Ighouba (Université Paris 1 Panthéon-Sorbonne), Raquel Victoria Benitez Rojas (Universidad Complutense de Madrid)
- **Facilitator:** dr Mateusz Lewandowski (Uniwersytet Jagielloński w Krakowie)
- **Author:** dr Mateusz Lewandowski (Uniwersytet Jagielloński w Krakowie)

The Covid-19 pandemic not only showed the significance of digital competence, but also revealed many inequalities concerning, for example, access to the Internet, financial insecurities, gender and ethnic divisions. This indicated the need for new education possibilities that were not seen previously. Colleges and universities should rethink higher education and change the way they operate, in order to better contribute to the long-run welfare.

In response to this challenge our team came up with the concept of Global Education Online GEO. This initiative takes the advantage of strengthening strategic partnerships between leading higher education institutions across the EU in order to enable students to obtain a degree by combining courses from different universities. In particular, GEO offers programs to enable more students to enrol for free Massive Open Online Courses (MOOC). This helps to educate students so that they are not deprived of higher education. With the newly gained experience in teaching online, stepping up like this would not even require classroom space, so student capacity constraints would not be an issue.

We believe that knowledge is the key to a better future and with modern technology everyone around the globe can become a student. GEO gives anyone access to higher education regardless of their socio-economic status and the country of origin.

The key aspects include:

- Free of cost Higher education that is accessible to anyone across the globe.
- Flexibility to choose the courses from a wide range of options offered by different universities.
- Lectures take place online and are pre-recorded.
- Examinations take place online.
- Obtain globally recognized degrees from reputed institutions across Europe.
- Equipment provided for students in need.

Figure 1. GEO prototype screenshot

Fostering digital citizenship

2

2. 1. Problem space

E-government

Prof. Maria Vela Perez, Universidad Complutense de Madrid

Introduction to the problem

The e-government field (also called Electronic Government, Digital Government, Electronic Governance, and by other similar names) emerged in the late 1990´s. Just like the term e-Commerce, the term e-Government was born out of the Internet boom. However, it is not limited to Internet use or publicly accessible systems for direct use by customers or citizens. E-government started as a field for practitioners, basically convening/gathering practitioners struggling to meet new challenges of the Internet medium by implementing new systems creatively.

There are several definitions that share/include common ideas, such as the need for organisational reforms that are accompanied by technology implementation, and the role of the government in society, that is, governance. Hence, e-Government refers to the use by government agencies of information technologies that have the ability to transform relations with citizens, businesses, and other arms of the government. These technologies can serve a variety of different purposes: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resulting benefits that may accrue from the above are, such as less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions.

The e-government efforts made by the European Union are based on the definition: e-government is aimed at the use of Information and Communication Technologies in public administrations combined with organisational change and new skills to improve public services and democratic processes.

The main problem(s) explained

The adoption and use of the e-government strategy can provide/offer significant benefits for the government in the delivery of more effective services and accurate information to all e-government sectors. However, several challenges can delay progress in realising the promise of e-government. The variety and complexity of e-government initiatives prove the existence of numerous challenges and barriers in the process of their implementation and management.

The implementation of e-government initiatives faces some technological obstacles, such as the lack of shared standards and compatible infrastructure among departments and agencies. ICT infrastructure is recognized to be one of the main challenges for e-government due to the lack of qualified personnel and training. Moreover, privacy and security are major impediments in implementing e-government in areas concerning citizens. The government has an obligation to ensure citizens' rights regarding privacy, processes and collection of personal data for legitimate purposes only as well as data security, referred to as cyber security or computer security, being a vital component of mutual trust between citizens and the government.

The most important objectives

1. To understand the definition and types of e-government.
2. To understand the benefits and barriers of e-government.
3. To know the aims and costs of e-government implementation.
4. To know the basic structure of e-government.

Audiences and expected value

The impact of e-government on the whole society is clear/obvious in terms of cost reduction and budget savings. E-government contributes to those benefits through the reduced cost of transactions for administrative procedures and via the provision of a better control of expenditure.

According to Eurostat Statistics, only 57% of individuals aged 16 to 74 reported using the Internet for interaction with public authorities in 2018. It is necessary to question the reasons for this low level of adoption of e-government.

Known major constraints

The implementation of e-government faces some technological difficulties, such as lack of shared standards and compatible infrastructure among departments and agencies. Also, privacy and security are critical barriers in the implementation of e-government in areas concerning citizens.

The technology evolution or the apparition of new technology will constitute another important factor to be considered.

Recommended sources of data

- https://www.sciencedirect.com/science/article/pii/S0040162519313150
- https://www.researchgate.net/publication/242098582_An_overview_of_critical_issues_of_e-government
- https://www.researchgate.net/publication/234008823_Introducing_e-Gov_History_Definitions_and_Issues#:~:text=%E2%80%9Ce%2DGovernment%20is%20the%20use,about%20governance%20rather%20than%20government.
- https://core.ac.uk/download/pdf/143886366.pdf
- https://research-repository.griffith.edu.au/bitstream/handle/10072/37709/67525_1.pdf
- https://www.oecd.org/governance/eleaders/43340370.pdf
- https://documents1.worldbank.org/curated/en/317081468164642250/pdf/320450egovhandbook01public12002111114.pdf
- https://www.tandfonline.com/doi/abs/10.1300/J199v02n03_01?journalCode=wplm20
- https://www.oii.ox.ac.uk/archive/downloads/research/files/Identity_e-Gov_chapter.pdf
- https://en.wikipedia.org/wiki/E-government
- https://www.digitalcitizenship.net/nine-elements.html
- https://www.oecd.org/gov/digital-government/35176328.pdf

Emergency Remote Education vs. Virtual Education

Prof. David Alonso Garcia, Universidad Complutense de Madrid

Introduction to the problem

The outbreak of the pandemic caused a disruption to face-to-face education around the world. Common practices at schools and universities to adapt to new context have been described as Emergency Remote Education (ERE), where the main goal/task was to directly transpose from previous face-to-face experience to an online format. With regard to the effects of the pandemic, international studies defined the modification in the Education Sector as “failure is common, and success is often a result of experience and learning from past failures” (World Bank).
However, virtual education reveals other issues compared to ERE. There is a wealth of literature showing the value and positive consequences of Virtual Education if it includes several features. Nowadays, it is believed that if ERE is extended or confused with Virtual Education, it might be risky or even precarious for the future of Education.

The main problem(s) explained

Taking into account some learning experiments such as “The Hole in the Wall” (S. Mitra) or the famous video of Robinson about “changing paradigms” in Education, it seems clear that new routes to learning innovation should be explored if one desires to participate in the novel educational project known as Education 4.0. Surprisingly, most of Emergency Remote Education (ERE) has not improved learning skills, but it has strengthened the previous traditional system with a change of format. Different reports and scientific studies ponder on the possibility for future learning of becoming hybrid between virtual and face-to-face education. The problem and the risk could be maintaining ERE approach and neglecting the other approach to virtual learning.

Virtual learning includes aspects such as:

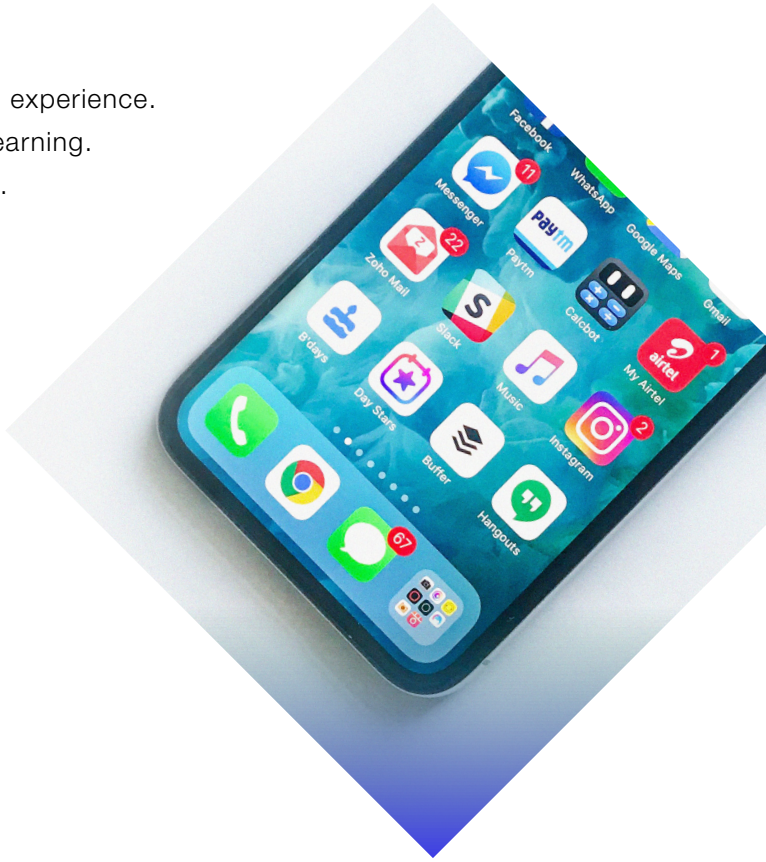
1. encouraging student-faculty contact;
2. encouraging cooperation among students;
3. encouraging active learning;
4. providing prompt feedback;
5. emphasizing the time for a task;
6. shaping/creating high expectations;
7. respecting diverse talents and ways of learning.

Most of the experiences within ERE have been designed in a manner so as to maintain a passive role of students, who only follow the tutor’s explanations through the screen. ERE is different to virtual education not only in its form but also in its setting. However, there is an evident risk that future learning will turn into an expansion of these kinds of approaches instead of virtual education’s principles.

This short talk will explain and explore several ways to escape this trend. Different technological tools will be used to design courses or other kind of activities from an innovative point of view. Active participation of the audience will be aimed at building links between creativity and technology.

Most important objectives

1. To describe the main characteristics of the ERE experience.
2. To explain the key issues of successful virtual learning.
3. To show relevant experiences of virtual learning.
4. To discuss future learning.



Audiences and expected value

1. Scholars from any field of knowledge.
2. Students from Education Faculties.
3. Innovation and entrepreneurship audience.

Known major constraints

1. Pedagogical limits to designing online courses.
2. Technological constraints.
3. Cultural constraints.

Recommended sources of data

• Ni Shé, C. et al (2019). Teaching online is different: Critical perspectives from the literature. Dublin: Dublin City University.

• United Nations (August 2020). Policy Brief: Education during COVID-19 and beyond. *https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/08/sg_policy_brief_covid-19_and_education_august_2020.pdf*

• VVAA, (2020). A global outlook to the interruption of education due to COVID-19 Pandemic: Navigating in a time or uncertainty and crisis. Asian Journal of Distance Education. Vol 15, 1.

• Video about the Hole in the Wall (S. Mitra): *https://www.youtube.com/watch?v=HE5GX3U3BYQ*

• Video “Changing Paradigms” (K. Robertson): *https://www.youtube.com/watch?v=zDZFcDGpL4U*

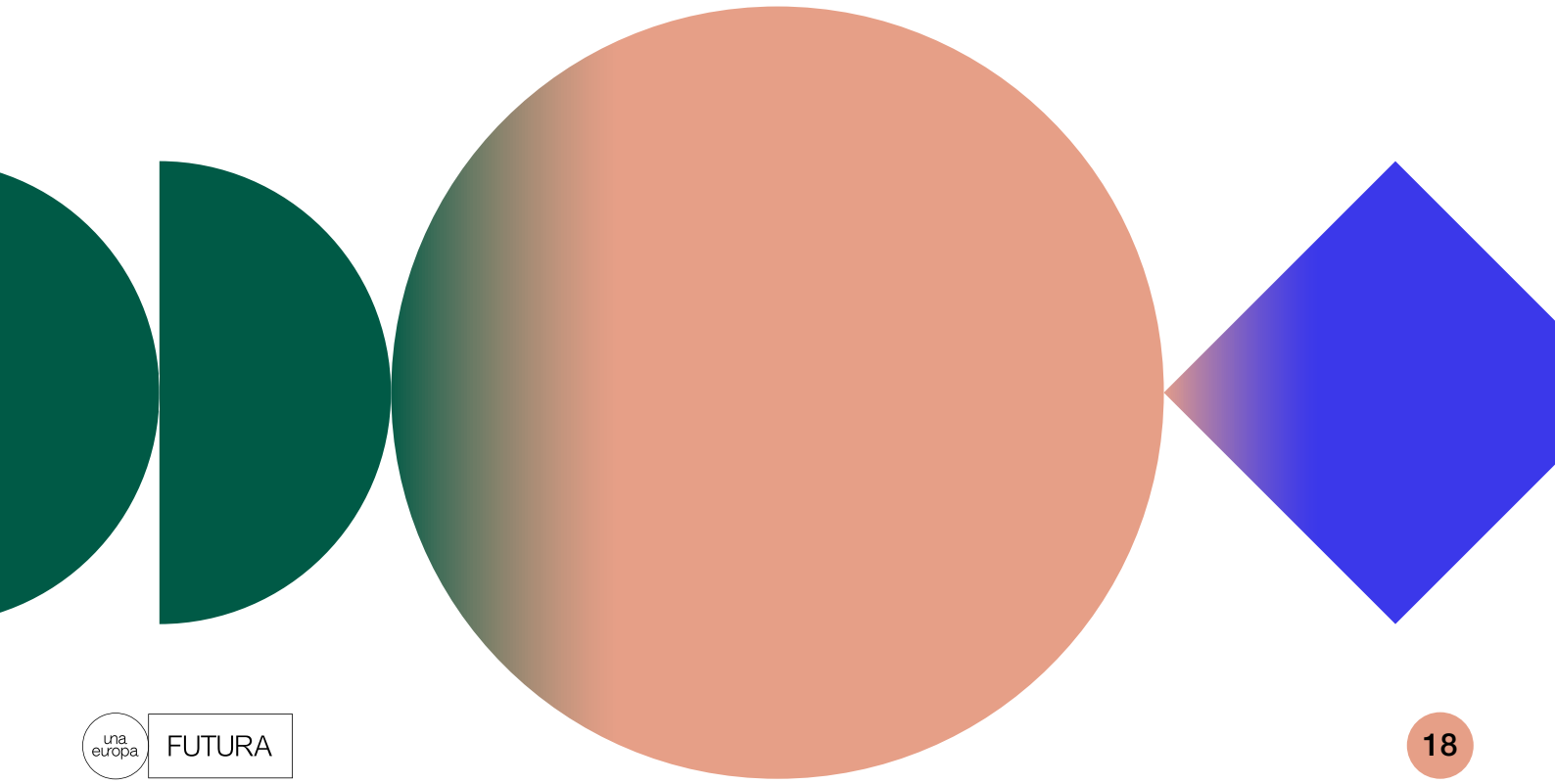
2. 2. Solution space

Online voting at the EU level

- **Team:** Kai Jun Eer (the University of Edinburgh), Nicole Sherstyuk (Freie Universität Berlin), Uuna Saarela (Helsingin Yliopisto)
- **Facilitators:** Arnoud Martens (KU Leuven), Agnieszka Wilanowska (KU Leuven)
- **Author:** Arnoud Martens (KU Leuven)

An effective democracy requires the involvement of its citizens in the voting process. A voting process that, despite growing urbanisation, is not uniformly evident across the EU. There remain countries and target groups within Europe that experience difficulties in getting involved in the voting process and in casting a valid vote in elections. Sometimes location is a problem and the government offers a solution by bringing the ballot box to someone's doorstep. However, responding flexibly to the accessibility of a ballot box comes at a cost. The financial resources of governments are scarce. Voting on paper still costs a lot of money. There are already countries in Europe that are jumping in on the digital ballot box.

The sprint of this group focuses on the digital voting system. It looks at countries that have already broken new ground, but also at dangers that lie in moving to a digital ballot box, such as the digital literacy of populations or the verification procedure needed to give your digital signature as a person without it being linked to your anonymous vote. Questions that are very much applicable in the digital Europe of today.



Una Idea – for direct democracy at the local level

Team: Lily Anderson (The University of Edinburgh), Anna Lecompte (Université Paris 1 Panthéon-Sorbonne), Mona Duwenhogger (Université Paris 1 Panthéon-Sorbonne), Louis Homont (Universidad Complutense de Madrid), Stanisław Szufa (Uniwersytet Jagielloński w Krakowie)

Facilitator: dr Magdalena Trzcionka (Uniwersytet Jagielloński w Krakowie)

Author: dr Magdalena Trzcionka (Uniwersytet Jagielloński w Krakowie)

Our group was working on a solution to the problem of society having little influence on governmental projects implemented at the local level. It was an ambitious task since the problem is extremely complex and multi-faceted. We leveraged the design thinking methodology, which allowed us to broaden our perspective and deepen our understanding of the issue. We reached out to experts from the Digital Society area, as well as to potential users of the solution with the aim of identifying their most pressing needs.

During five intensive days that the project lasted, we managed to come up with a unique and innovative solution: a mobile application that is a communication platform and a tool for direct democracy at the local level. The creative process was strongly driven by methodology and hence was very specific, oriented towards user needs. Yet, at the same time it was an exciting exercise of exploring different areas of knowledge. Design forms prepared by the organisers and their operational support turned out to be crucial in our work.

We had a great time together, making new friends from across Europe and creating long-lasting memories.

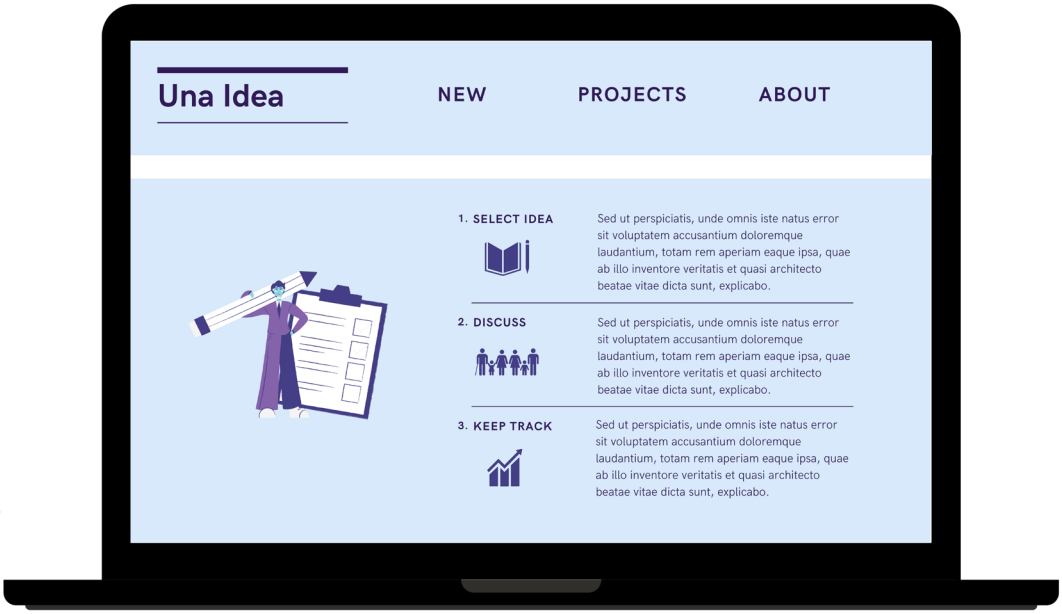


Figure 2. Una Idea prototype screenshots

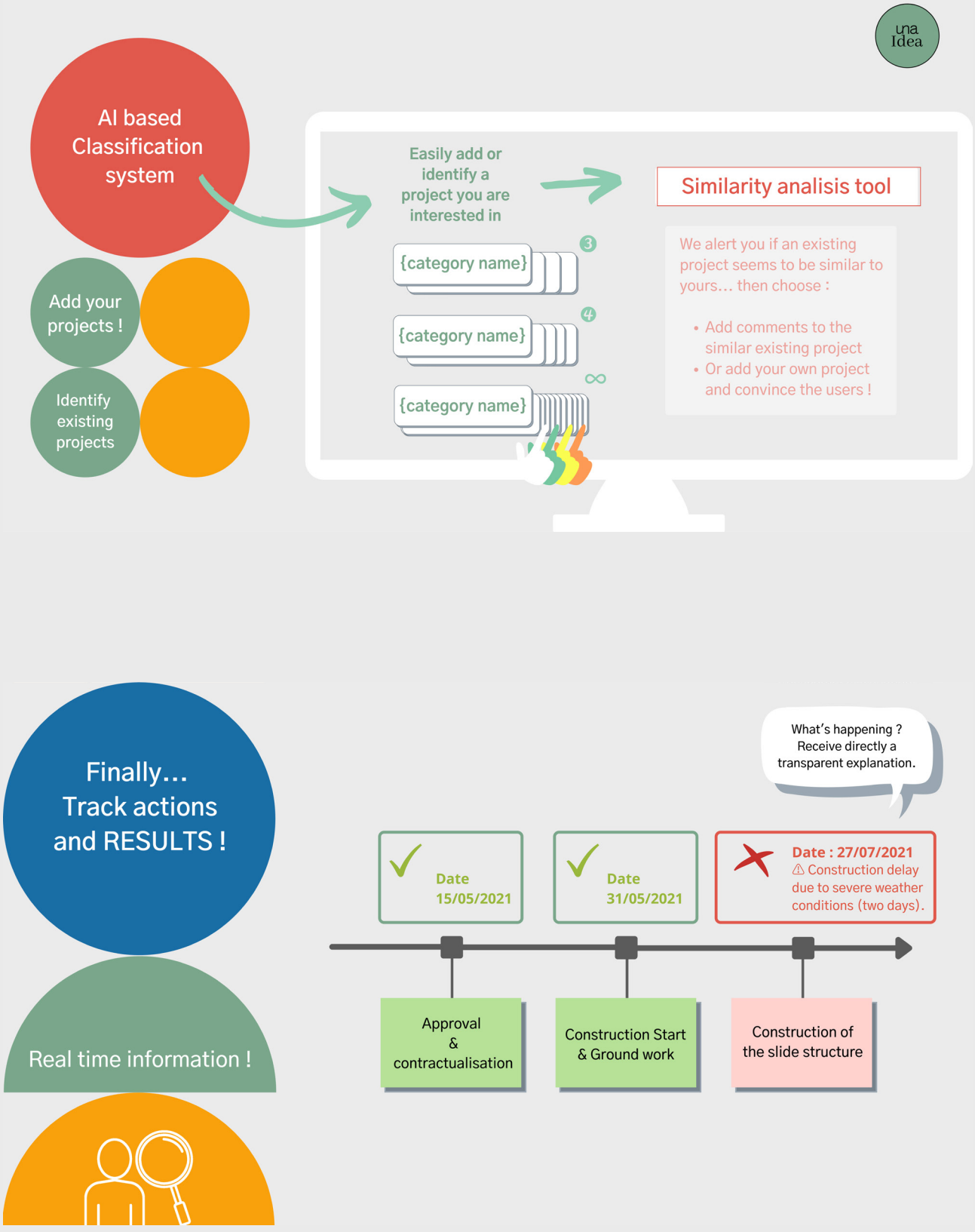


Figure 2. Una Idea prototype screenshots

Global Hub

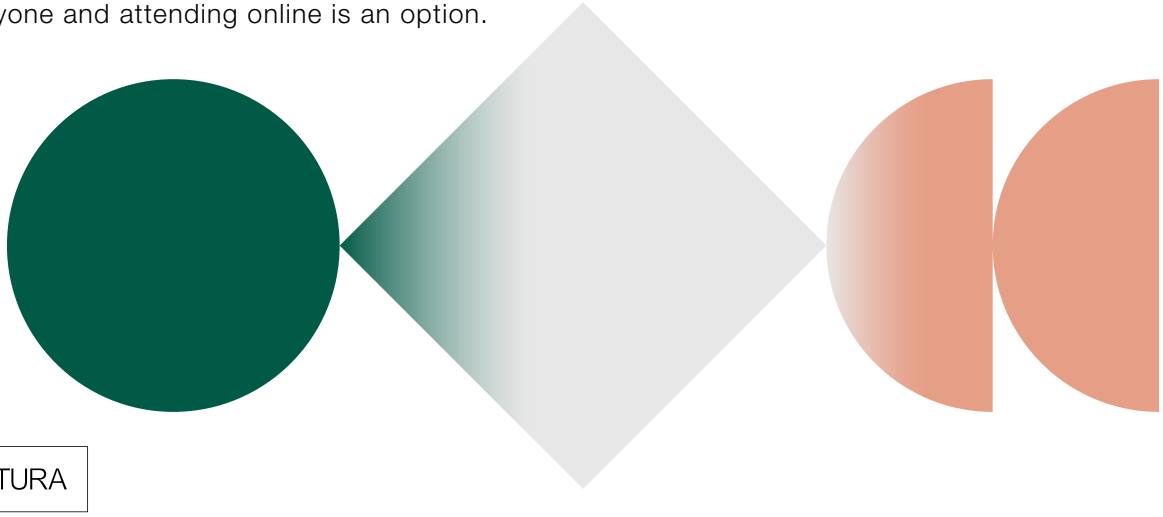
- **Team:** Magda Sawczuk (Uniwersytet Jagielloński w Krakowie), Paloma Feltre (Université Paris 1 Panthéon-Sorbonne), Helmi Lappalainen-Imbert (Helsingin Yliopisto)
- **Facilitator:** Venla Parkkila (Helsingin Yliopisto)
- **Author:** Venla Parkkila (Helsingin Yliopisto)

Team 4 taps into the inequalities of work-life. The wage gap, unemployment, and differences in relevant knowledge and skills are partly explained by the inaccessibility of important resources. People don't necessarily know where to look for information or the information is not presented in an understandable way. Our solution is an accessible online platform for people who want to update their work-life-related skills or search for employment.

The platform collects important information in one place – resources on topics such as education and life-long learning, volunteering, online entrepreneurship, and trainee programs can then be found in one place. Our target group is very diverse and this is why we want to create a tool that filters resources most relevant to the user – people could start looking for information by describing their current situation and the resources they are looking for. The platform can then provide information most useful to the user. This saves time and makes information-seeking less stressful.

The platform is accessible, easy to use, and completely free of charge, which reduces inequality – not so much depends on your experience or existing knowledge and networks when accessible information is available in one platform. The online platform also encourages people to connect globally and look for opportunities outside of their home country.

Our assumption was that there is an increasing demand for platforms like this in our society and our test group verified this. Una.Futura universities could help the project by sharing information on the courses, webinars, and workshops they organise – as long as these are free of charge, open to everyone and attending online is an option.



Boosting the digital economy

3

3. 1. Problem space

Cryptocurrencies

Prof. Carlos Corullón Hermosa, Universidad Complutense de Madrid

Introduction to the problem

In 2008, after the financial crisis, the Blockchain technology appeared as the technology that could create a new currency: bitcoin, the first digital currency. The goal of the Blockchain technology is to allow an interchange of money without intermediaries. Satoshi Nakamoto devised bitcoin. He used the Blockchain technology for creating bitcoin and allow the interchange of money without intermediaries, neither banks nor other financial entities. Bitcoin was the first of several cryptocurrencies.

The main difference between cryptocurrencies and traditional currencies, such as $US, €, etc. is that the cryptocurrencies are not fiat money, and they are neither supported by any Central Bank nor recognized as any precious metal. It means that the value of cryptocurrencies is based on the user confidence as well as on the market evolution. The users of any cryptocurrency cannot act upon a legal basis. Therefore, in case of a decrease in the value of cryptocurrencies or a refusal to purchase an item by paying with this kind of currency, the users can neither seek institutional aid, nor claim governmental support.

The main problem(s) explained

Due to the lack of public control over cryptocurrencies, no government can ensure the use of this currency on the market while purchasing goods. Obviously, the Central Bank cannot set/place the value of cryptocurrency, and therefore the major problem lies in calculating confidence in the cryptocurrencies as well as in measuring that confidence. Other problems arise when trying to consider a cryptocurrency to be a value deposit or as financial assets. A cryptocurrency is a digital

currency that can be used for purchasing a limited number of goods or services at a very volatile price.

Although this kind of financial instrument is named as cryptocurrency, or digital currency, Bitcoin cannot be regarded as a currency, because cryptocurrencies are not accepted as a unit of account, and neither as a deposit of value nor as a means of payment. Cryptocurrencies are being used nowadays as a financial product for storing value. Everybody hopes that the value will increase in the future, and then they will exchange their cryptocurrencies for fiat money easily making big profits. Nevertheless, all financial transactions run risk, and cryptocurrencies are not an exception. The thinking of Crypto holders that cryptocurrencies hold the same position and enjoy the same protection as the local currency is erroneous, which means that they have to face a greater risk. Actually, cryptocurrencies work more like a stock-option than a currency, but a lot of users do not acknowledge it, and surprisingly, they feel higher confidence in cryptocurrencies than they should do.

Most important objectives

1. To understand the legal state of cryptocurrencies.
2. To understand the difference between a local currency and cryptocurrencies.
3. To assess the risk associated with cryptocurrencies, mainly the lack of institutional and governmental support in case of a significant decrease in the value of cryptocurrencies.
4. To measure the risk if banks offer their clients the option to invest in cryptocurrencies.
5. To understand that cryptocurrencies are based only on technology.

Audiences and expected value

The impact of cryptocurrencies produces a global effect in the world economy, and the position of each country depends on multiple factors, such as, the access to technology, the impact on its domestic market, the effects in the world trade, etc.

Countries like China, Brazil or India are opposed to adopting cryptocurrencies. In other countries like Japan or Korea, the use of cryptocurrencies is massive. Whereas, Italy or Turkey is thinking to devise its own cryptocurrency.

The fiscal treatment also has to be taken into account. In several countries like Spain, cryptocurrencies are a legal method of paying, and VAT (Value Added Tax) has to be imposed on such purchases. If the value of cryptocurrencies creates wealth, taxes have to be paid for that reason.

Known major constraints

The Blockchain technology has no parent country, which means there is no country in charge of ensuring the reliability of transactions made in cryptocurrencies.

The use of cryptocurrencies and its scale in the economy will depend on the regulations countries will have to implement in the next few years. Their global nature and the possibility of

cryptocurrencies being accepted as local currencies for purchasing all kinds of goods and services will have to be taken into account.

The technology evolution or the apparition of new technology will constitute other important factors that should be taken into consideration.

Recommended sources of data

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- https://www.reuters.com/article/us-cryptocurrency-cybercrime/cybercriminals-target-booming-cryptocurrencies-report-idUKKBN1FL5Q7
- https://www.elmundofinanciero.com/noticia/89387/emf-in-english/how-cryptocurrencies-impact-estate-planning.html
- https://www.semanticscholar.org/paper/LEGAL-AND-ECONOMIC-ANALYSIS-OF-THE-CRYPTOCURRENCIES-Srokosz/1bbbe12325b662647f0bbe3a7bbf148cae223c3d
- https://www.arcgis.com/apps/Cascade/index.html?appid=b9bafd50ab5f4eec9a77925cec0db09d
- https://www.burges-salmon.com/news-and-insight/legal-updates/fintech/cryptocurrencies-and-climate-change/
- https://link.springer.com/article/10.1007/s12027-019-00561-1
- https://heinonline.org/HOL/LandingPage?handle=hein.journals/caswestres9&div=3&id=&page=
- https://hrcak.srce.hr/160591
- https://eur-lex.europa.eu/legal-content/GA/TXT/?uri=CELEX:52021AB0004
- https://www.ecb.europa.eu/paym/digital_euro/html/index.en.html
- https://www.ecb.europa.eu/home/search/html/crypto-assets.en.html

Digital competencies

Prof. David Alonso Garcia, Universidad Complutense de Madrid

Introduction to the problem

The 21st century has brought about a pattern shift with respect to technology. The industrial revolution has transformed into a new economic domination of information and technology. In this sense, digital technologies play a relevant role in societies, organisations, and for individuals. Digital technologies are used in almost every aspect of human life. Specifically, technology has affected all spheres, such as economic, social, and especially human behaviour. In addition, the digital era has contributed to expanding the contemporary workforce and workplace.

People all over the world are concerned about digital technologies and influenced by the 'Internet of Things': computers, smartphones, electronic devices, virtual reality and artificial intelligence. In this context, digital competencies are necessary to work, study, communicate, access online public services or find information. Governments will have to deal with all problems connected with the digital skills gap, and they should also promote projects and strategies which contribute to improving the level of digital competencies among citizens. Particularly, European Commission is determined to provide access for the citizens to increase their adequate digital competencies.

The main problem(s) explained

In the current era, in which digitalization is predominant, the digital gap becomes more relevant in the development of individuals and their interactions with institutions, enterprises and services. The main problems of digital competencies are, on the one hand, the incapacity of the elder population to understand these new kinds of interactions, and on the other hand, in the new digital economy it turned out that there is a lack of staff with adequate digital skills.

In this sense, digital competencies become crucial in the new digital economy. Hence, governments and institutions have to be prepared and face a shortage of digital experts who can develop cutting-edge technologies for the benefit of all citizens. The participation in a digital society and economy becomes a challenge of the 21st century. Europe cannot avoid this issue.

In conclusion, the main problem is to confront the digital skills gap. Therefore, Europe needs to strengthen competitiveness, where digital competencies are crucial for the labour market as well as innovation and development. Nonetheless, the key challenge is to achieve a consensus on new digital competencies, their description and acquisition.

The most important objectives

1. To realise that digital technologies are applied in almost every aspect of human life.
2. To understand that digital competencies become crucial for any citizen in order to interact with

the government and the system.

3. To develop digital competencies of the entire population with special emphasis on the part of society that is not involved in or is left behind in the technological revolution.
4. To deal with all problems connected with the technological gap that touched the adults due to their exclusion from the system.
5. To run projects and develop strategies for the younger population in order to improve the level of their digital skills.
6. To innovate and modernise education and training.
7. To ensure that the full potential of digital technologies is used for learning (open education).

Audiences and expected value

Digital competencies have become crucial in the day-to-day responsibilities. Full integration of digital technologies is necessary in many European countries.

There are four key actors, namely, citizens, societies, organisations and teachers who can tackle the problem of the digital gap in European countries. There are different kinds of competencies, all of which focus on the particular implications of digital transformation.

Digital competencies will enforce connectivity, human capital, the use of Internet services, digitization process in businesses, and all aspects linked with e-government and digital public services.

Known major constraints

Inequalities among European countries in the field of e-government, open education, e-learning, etc. Digital competencies are an open issue, because they are constantly changing and developing.

One should be careful to claim “digital competencies of the 21st century”, because the speed of evolution in the digital era may cause the feeling of vertigo. Transformation and development of technologies never stop.

It is extremely difficult to find professionals with new digital competencies, which is becoming essential and crucial for innovation, growth and participation in a digital society and economy.

Recommended sources of data

- *https://digital-strategy.ec.europa.eu/en/policies/digital-skills-and-jobs*
- *https://ec.europa.eu/social/main.jsp?catId=1223*
- *https://ec.europa.eu/jrc/en/research-topic/learning-and-skills*
- *https://digital-strategy.ec.europa.eu/en/policies/desi*
- The Digital Economy and Society Index (DESI).
- Kamaljeet Sandhu (2020). Leadership, Management, and Adoption Techniques for Digital Service Innovation. University of New England, Australia.

3. 2. Solution space

Digital Wallet – Cross-border family transfers made easy

- **Team:** Charles Mangala (Université Paris 1 Panthéon-Sorbonne), Evelin Muller (Freie Universität Berlin), Mohamad Alsadhan (The University of Edinburgh), Dima Miedzianowski (Uniwersytet Jagielloński w Krakowie)
- **Facilitators:** dr Maksymilian Galon (Uniwersytet Jagielloński w Krakowie), Silvia Stagni (Università di Bologna), Maria Cecilia Flores (Università di Bologna)
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Our teams were assigned to Challenge 3 but, unfortunately, some members had to withdraw from participating in Una Futura. For this reason, we merged two teams in the same challenge and we were happy to realise that neither team had any problems in getting to know each other for the second time and they really had no problem at all in collaborating in every step of the process!

Here is the initial problem that they selected: you are from abroad. You come to study and ... the money is running out! How to solve this embarrassing situation quickly, safely and cheaply? How can your family send money from your native country? We found this challenge very important and decided to solve it with the help of design sprint.

We interviewed, identified needs, and discovered that a robust application was needed. In our opinion, the most important thing is that its users are safe (both when it comes to sending money as well as personal data) and that our solution is cheap (preferably free). The application should work quickly and reliably. We prepared a prototype of the application, pleasant, minimalist, clearly defining the principles of operation, and we conducted tests.

The tests showed that, first of all, we need to show why we differ from other money transfer options in order to convince the segment of older users. Secondly, it is important that the number of people using the application is large because very often transfers are made between friends, so using the same tool is absolutely necessary. During the work on the application, we also learned that it is necessary to have a security guarantee. It is hard to win against banks when it comes to the mindset of the generation of parents (which is not the case for the generation of their children).

Working on the project was a fantastic experience of working in an international team. The team is going to keep working, so expect a new, better application that allows you to make money transfers.

CC-101 – Educational platform to get you started with cryptocurrency

- **Team:** Noël Moussa (KU Leuven), Kinga Walaszek (Uniwersytet Jagielloński w Krakowie), Celeste Luciano (Università di Bologna), Diana Belozjorova (Helsingin Yliopisto), Julie Thomas (Université Paris 1 Panthéon-Sorbonne)
- **Facilitator:** Ifeoma Kulmala (Helsingin Yliopisto)
- **Author:** Ifeoma Kulmala (Helsingin Yliopisto)

Understanding cryptocurrencies is an important citizen skill of the future. 13 years ago, no-one had heard of cryptocurrencies, but now 74 million own them and their relevance will continue to grow. Understanding cryptocurrencies makes it possible to understand the opportunities and threats they bring, public policy-building related to the economy as well as private behaviour towards the financial markets. Therefore, better understanding of cryptocurrencies is advantageous for both the individual and the society at large.

However, the majority of us do not understand them, as knowledge and education on cryptocurrencies is lacking. It is not about the lack of interest: rather the information shared at the moment is often written in a technically complex language or is not trustworthy enough.

To solve this problem the team has created CC-101: a fun, friendly website that does not push you away from your desire to learn about cryptocurrencies. It offers information for innovation opportunities for everyone from a high school student to an entrepreneur and builds general trust towards cryptocurrencies. The website serves as an educational platform with up-to-date information, videos and games presenting complicated knowledge in a fun and entertaining way. CC-101 also has a special focus on community-building. It provides the opportunities for exchanging ideas with others, building projects and consultation from experts through chat and group functions. As education should not be a private resource, the content on the site is provided for free, building an efficient ground-based economy for all.

Figure 3. CC-101 prototype screenshot

Embracing the augmented human

4

4. 1. Problem space

AI & autonomous agents

Prof. Gustavo Díaz Matey, Universidad Complutense de Madrid

Introduction to the problem

Artificial intelligence (AI) can be defined as the ability of machines to perform activities that require human intelligence. In short, AI means copying human cognitive functions in order to learn and solve problems. AI will have functional practical applications and will be a transformative element in our daily lives (public and private). What is meant here is technological uniqueness, which can be understood as the ability of a machine to learn only by moving away from the concept of automated passive tools which will bring benefits but also reveal many threats.

"Take self-driving cars as an example. In traffic, 90% of traffic accidents are related to human error, and self-driving cars equipped with GPS, radar, cameras, and various sensors serve as artificial eyes and ears, and their reaction speeds are faster and the judgements they make are better. It is hoped that traffic accidents caused by human factors will be completely eliminated."[2]

Despite different opinions of experts in technologies related to Artificial Intelligence, it is not clear whether the application of these technologies in different sectors is global or revolutionary, since the capillarization of AI is closely related to the degree of development, and to the connection of each region, country and sector. AI contains many technologies.

2 Tencent Lab and Tencent research Institute, (2021): Artificial Intelligence, A National Strategy Initiative, Singapore, Palgrave McMillan, p.6

The main problem(s) explained

1. Perception problem – Artificial Intelligence is about learning, deciding and predicting (statistically with deep learning algorithms). All this is due to the development and use of massive amounts of relevant data from our environment. From this perspective, it is necessary and crucial to understand what big data reflect, and how it can be applied to Artificial Intelligence. At this point it should be highlighted that automated does not mean autonomous. The concept of artificial intelligence does not only refer to scientific common knowledge but also to a form of popular and commercial culture and it may be easily misunderstood.

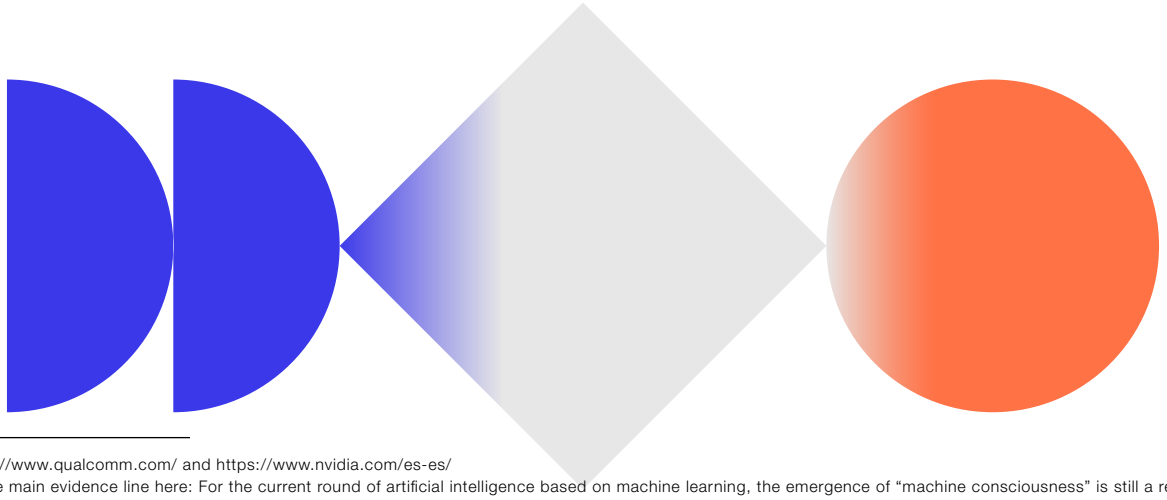
- The importance of 5G, semiconductors[3] and the implementation and related infrastructure associated to AI.

2. The 4.0 industrial revolution ahead - Klaus Schwab, the founder of world economic forum, stated that people faced an era of the 4th industrial revolution and numerous experts predicted the transformative nature of Artificial Intelligence. The world will change due to Artificial Intelligence, for better and for worse. AI will cause job losses and the creation of new ones, ethical issues, technology-related disorders and new international competition between countries (mostly European Union, China and the United States).

- Industry 4.0 - Among others: autonomous driving, virtual assistants, research/education, financial services, medicine and diagnostics, design and artistic creation, legal practices such as contracts and lawsuits, social companionship, and services and industry production.

3. Transformative societies: smart cities vs nature – The access and use of Artificial Intelligence and Autonomous Agents may be really biased, leaving a significant part of the society and humanity behind. Elderly people, people with inadequate resources or poor education, low-income countries may not gain access to IA. Moreover, they may feel deep aversion to accepting new realities (see Luddites in the 2nd Industrial revolution, for example)

- What makes humankind unique? The answer is emotions, “machine understands human emotions, but this does not mean that it will show “empathy” like humans.”[4]



3 https://www.qualcomm.com/ and https://www.nvidia.com/es-es/

4 As the main evidence line here: For the current round of artificial intelligence based on machine learning, the emergence of “machine consciousness” is still a relatively distant research direction and will not be taken into the account here. Please keep in mind that Artificial Intelligence Is not equals to robots.

The most important objectives

1. Identify potential opportunities and future problems in Artificial Intelligence.[5] Evaluate the importance, impact on different levels and in different regions (cooperation and competition in the international arena focusing on the European Union and its unique reality.

2. Briefly discuss the new social contract between the State and entrepreneurs, society and machines (in the future) Consider potential gender/race/age biases related with autonomous agents.

3. List the main solutions and their impact. Find ways to evaluate the possible solutions, and obtain feedback from multiple sources. The evaluation should be carried out from a technical point of view. Also, assess ethical, sociological and economic implications of the solution.

Audiences and expected value

Artificial Intelligence is expected to have a significant impact on every person in the near future. The revolution is at the doorstep and will affect all aspects of human life. It is believed that this transformation will be gradual but global and irreversible. The European Union will have to face this upcoming reality, and find a way to combine human rights and the new issues that Artificial Intelligence will bring.

AI research is normally seen as a new technical science made up of theories, methods, technologies, and applications that can simulate, extend, and expand human intelligence. Lots of things that occur every day, such as calculation, observation, dialogue and learning, all require “intelligence.” The development of AI is not just about technology improvement but also about integration into economic and social values.

Known major constraints

Psychological / Sociological Constraints - trust is the main issue here and requires a system of practice that helps guide through the security and ethical management of artificial intelligence systems. This includes coordinating social norms and values, demanding algorithmic accountability, enforcing compliance with prevailing legal norms as well as ensuring the integrity of data algorithms and systems, and protecting personal privacy.

Accessibility and Time Constraints (due to age/education/resources/competition among countries and enterprises) are vital to be taken into account, because the advances may be faster than they could be handled. The proposed solutions may become obsolete as soon as new technology becomes available.

5 Keep in mind that Artificial Intelligence is a collective term for a group of technologies.

Recommended sources of data

The United Nations:

- https://www.itu.int/dms_pub/itu-s/opb/gen/S-GEN-UNACT-2020-1-PDF-E.pdf
- https://www.un.org/en/chronicle/article/towards-ethics-artificial-intelligence
- http://www.unicri.it/in_focus/on/UNICRI_Centre_Artificial_Robotics

European Union:

- https://digital-strategy.ec.europa.eu/en/policies/european-approach-artificial-intelligence
- https://digital-strategy.ec.europa.eu/en/library/coordinated-plan-artificial-intelligence-2021-review
- https://ec.europa.eu/info/sites/default/files/commission-white-paper-artificial-intelligence-feb2020_es.pdf

China New Generation Artificial Intelligence Development Plan

- https://www.newamerica.org/cybersecurity-initiative/blog/chinas-plan-lead-ai-purpose-prospects-and-problems/
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- https://think-asia.org/bitstream/handle/11540/10758/KIEPopinions_no98.pdf?sequence=3
- http://www.china.com.cn/zhibo/zhuanti/ch-xinwen/2016-05/23/content_38515829.htm

US National Artificial Intelligence Research and Development Strategic Plan.

- https://www.nitrd.gov/pubs/National-AI-RD-Strategy-2019.pdf
- https://www.ai.gov/
- https://www.nscai.gov/2021-final-report/

Miscelanius:

- https://deepmind.com/about
- https://tisi.org/15078

Extended cognition & agency modulation

Prof. Asun López-Varela, Universidad Complutense de Madrid

Introduction to the problem

Although technologies have been used to extend human capacities since antiquity, as can be seen in ancient mythologies (Mayor 2018), the rapid development of Information and Communication Technologies ICTs, robotics and AI is triggering new research into what has been termed “Wide Cognition”.

Cognition entails very complex networks of biological processes and actions that encompass perception, attention, manipulation of objects, memory mechanisms, and the formation of knowledge by means of direct experience as well as by learning from other people, for which forms of communication and comprehension are also necessary. Additionally, processes of judgment and evaluation by various means (i.e., reason, conscious awareness but also unconscious functions of the mind) are necessary. Finally, knowledge becomes operational in critical thinking and specific decision-making. In view of this complexity, many different disciplines are involved in the study of cognition. Among them: neuroscience, anthropology, psychology, sociology, philosophy, semiotics, linguistics, and more recently, computational intelligence, information processing, and neural networks used in machine learning, to name but a few. This interdisciplinarity is both a problem and an opportunity.

How is cognition related to agency attribution and why does it matter in the Augmented Human Challenge?

The impact of technology on human lives might not be entirely positive. For instance, there are dangers behind the excessive use of smartphones. There are problems of agency attribution behind the use of automatic machines, for example in future autonomous cars involved in accidents. Who will be responsible for an accident: the driver, the designer? Is technology targeting diversity?

Until recently, agency was a privilege of human consciousness in its connection with intentional action, a view originated from the Cartesian mind / body dualism, which posited self-awareness and purposefulness as essential components of the human mind. This position, which also highlighted human superiority, justified the use of the natural world to satisfy human needs. During the 20th century, however, the increasing engagement with digital machines gave rise to an inquiry into new forms of agency beyond the human. From a cognitive point of view, these changes have contributed to re-imagine the way we understand, represent, and explain the world, communication with a diversity of other humans and, ultimately, our relationships with nonhumans - that is, technologies like computers and other machines, and also bio-entities (animal, plants, and the environment in general).

In this panorama, it is imperative to inquire into questions such as the following: What kind of

interactions, or rather ‘couplings’ (to use a term from ‘wide cognition’) occur between humans and nonhumans? What is the Augmented Human? What do human extensions mean in terms of cognitive enhancement? How is diversity taken into consideration? What are the ethical ways of managing co-agency in the framework of neuro-technologies, especially those that could allow, not just human cognitive extensions, but also the manipulation of human beings? What forms of agency and responsibility are contemplated in future AI?

The main problem(s) explained

This challenge contemplates the pros and cons of the Augmented Human scenario and raises awareness about the inter-dependencies among species on the planet.

The growth of so-called intelligent agents in cybernetics first expanded the notion of agency to include artificial entities able to direct their activity towards a given purpose or goal. Some forms of AI can learn from their actions, being designed as ‘autonomous’ entities capable of functioning in the absence of human intervention. Thus, the development of cybernetics has contributed to the recognition of various forms of agency, whether purpose oriented, as in AI, or intentional in the phenomenological sense.

Shaun Gallagher has been working on the relationship between embodied cognition, social cognition and agency since the 1990s. In 2000, he proposed two concepts related to the sense of self and intentional action. According to Gallagher, the ‘minimal self’ experiences self-consciousness as an immediate subject of experience; but this experience is only punctual and not extended in time. On the other hand, the ‘narrative self’ involves personal identity and continuity in time; a more or less coherent self (or self-image) constituted with a past and a future within the various narratives that we, and others, portray about ourselves. The ‘minimal self’, Gallagher claims, aligns with the way the minds of complex animals might work, following motor functions, and also with models on robotics and the first generation of AI. Gallagher’s ‘narrative self’ considers the building of conscious mental narrative structures, a distinction that amounts to a modulation of agency. In other words, the ‘minimal self’ might be aware of self-agency but not have the sense of self-ownership for actions, a continuity which is only achieved by means of language acquisition and the development of the ability to make the kind of cause-effect semiotic connections present in narrative and explanation.

The ‘Extended Mind’ hypothesis endorsed by Andy Clark and David Chalmers (1999) focused on investigating the role that the environment plays in shaping the nature of conscious experience (Chalmers “Foreword” in Clark 2008: xv). Indeed, recent studies show that certain forms of adaptive behaviour arise from perceptual dynamical ‘couplings’ between the nervous and the peripheral sensorimotor systems in a sort of multidirectional process.(Clark 2008: 16) According to the Clark, there are couplings between the organism’s perceptions and the objects/artefacts in the environment that play a functional role. These are filtered in sensorimotor activity and propagated across the cognitive system: “operations are not in the neural system alone but in the whole embodied system located in the world.” (Clark 2008, 14)

The appeal to coupling is not intended to make any external object cognitive (insofar as this notion is even intelligible). Rather, it is intended to make some object, which in and of itself is not usefully (perhaps not even intelligibly) thought of as either cognitive or noncognitive, into a proper part of some cognitive routine. It is intended, that is to say, to ensure that the putative part is poised to play the kind of role that itself ensures its status as part of the agent's cognitive routines [...] It is not the mere presence of a coupling that matters but the effect of the coupling—the way it poises (or fails to poise) information for a certain kind of use within a specific kind of problem-solving routine. (Clark 2008: 87)

In spite of sensorimotor coordination and the dynamics of the agent-environment interaction with a basic appearance of intentionality, Clark explains that some couplings are not functional, and they cannot be considered 'extensions'. For instance, artefacts such as memory pads, used to treat Alzheimer's disease, the walking stick of a blind person, or any other technology designed for accessibility, need to be considered in their complementarity with neural regions in order to be considered 'extensions'. Thus, the consideration of 'extended mind' activity seems to presuppose a functional and purpose-centred view of agency connected to semiotic activity; however unconscious it may be. In other words, agency might be mindful in the sense of being phenomenally charged, and intentional (whether conscious or not).

Along the lines of agency modulation, the approach known as Material Engagement Theory (MET) emphasizes material agency as a non-anthropocentric approach, opening the way to posthuman conceptions. MET proposes that both form and meaning emerge simultaneously through coupling mechanisms. In the case of symbols, Malafouris indicates that engagement takes the form of "a sort of visual code or language and thus invites reading" (2007: 293). This suggestion is aligned with Gallagher's claims about the 'narrative self'. MET also agrees with the "Extended Mind" hypothesis that the human mind is deeply entwined with material culture, although according to Malafouris, Clark's theory is "simply an expansion of the ontological boundaries of the res cogitans rather than the dissolution of those boundaries altogether" (Malafouris 2013:65).

The functional anatomy of the human mind (which includes the whole organism, that is, brain/CNS and body) is a dynamic bio-cultural construct subject to continuous ontogenetic and phylogenetic transformation by behaviourally important and socially embedded experiences. These experiences are mediated and sometimes constituted by the use of material objects and artefacts (e.g., the blind man's stick) which for that reason should be seen as continuous, integral, and active parts of the human cognitive architecture. (Malafouris 2013: 244)

Rather than accepting agency as the result of prior intention, Malafouris sees it as the emergent product of semiotic activity, conceiving it as the ability to bring about changes in the world: “material culture is the capacity of material things to operate as signs” (Malafouris 2013: 89). Material signs mean because “meaning is not the product of representation but the product of a process of conceptual integration between conceptual and material domains.” (Malafouris 2013: 90) Thus, MET can be seen as an attempt to decouple agency from human consciousness and to modulate intentionality.

Indeed, in the Anthropocene the need arises to consider forms of intentionality that come from nonhuman entities, like natural ecosystems, and which are related to aspects such as global warming, climate change or the implications of the COVID-19 crisis. Some forms of material eco-criticism are being directed towards the consideration of forms of agency in nonhumans. Jane Bennett speaks of “thing-power”, that is, things that have “propensities, or tendencies of their own” (2010: viii). Stacy Alaimo develops the concept of “trans-corporeality”, bodies that are not self-enclosed but open to everything else in the world. Like proponents of enactivism, these scholars emphasize that agency and intentionality are not “properties of things, they are not properties of humans either; they are the properties of material engagement.” (Malafouris 2013: 18, 119)

Domenico Parisi, Director of the Institute of Cognitive Sciences and Technologies, National Research Council Italy, has written extensively about agency attribution in artificial life and robots. AI and robots, even those without human features (humanoid), have been seen to elicit agency attributions in humans. Mark Coeckelbergh has also discussed the problem of agency attribution in AI and the issues it raises with regards to responsibility for actions. Coeckelbergh concludes that “even if (some) AIs can act or decide (i.e. have agency), they lack the capacities for moral agency, and so the responsibility for their actions or decisions—actions and decisions delegated to them by humans—remains and should remain with the human agents who develop and use the technology.” (Coeckelbergh 2020: 2055)

There are also problems derived from human agents using AI and taking decisions based on recommendations by the AI, not being able to explain later why the decision was taken. Thus, the need arises to discuss further the “experience of agency” from the point of view of semiotics and in relation to ethics and moral responsibility in the Anthropocene.

Concerning the Augmented Human Challenge, explored in the Una Futura Concept Book, in view of the above considerations, any extensions performed on the human body that might involve agency attribution need to be carefully considered. Beyond the utopian world of augmented humans painted by Transhumanist position, critical Posthumanist approaches consider not just diversity in humanity, but also inter-species relations.

The most important objectives

Definition of supporting strategies:

- Put young people in charge of projects to help build their mindset.
- Support 4C reflective practices (Creative and Critical Thinking, Cultural Understanding, and

Collaboration) and formalize a structure of cooperation through Design Thinking.
- Introduce 4E cognition and its relation to the Augmented Human Challenge.
- Use a social methodology (Design Thinking) to provide soft skills, encourage group engagement, self-organisation, awareness and responsibility.
- Create a 'manifesto' of needs.
- Foster grass-root ideas for a project that can create a certain impact and consider inclusion and accessibility.

Help young people gain awareness:
- Create mechanisms of 'estrangement' by means of speculative art in order to shake participants out of their comfort zones; awaken encounters with nonhumans; focus on inclusion (age, status, gender, disability, etc.) and introduce species interdependence; Understand the importance of working collaboratively and in an interdisciplinary way. Think outside the box.
- Reflect on the present, past and future of automata, robots, cyborgs and AI and consider how technological development influences the human world. Learn about posthuman culture and AI by means of exploring the world of automata in mythology and within the history of technology.
- Discuss topics such as decision-making in the digital world, technology & social inequality, posthumanism vs. transhumanism, ethics law & policy, chips and implants, brain-computed interfaces, human-robot interaction, responsibility of autonomous agents, AI, neuro-ethics and robotics
- Reflect on how humanoid robots can trigger empathic and emotional responses in humans, which in turn may arise a reflection on how material aspects of design contribute to cognitive engagement.

Implementation:
- Help participants to prototype ideas and share them on social networks (Instagram, YouTube, etc.).
- Help participants implement their prototypes and maintain the sustainability of their projects.

Audiences and expected value

- Students and scholars from any field of knowledge.
- Innovation and entrepreneurship audience.

Main expected values:
- Youth engagement and possible scalable ideas and projects.
- PBL: Project Based Learning. Participants learn by developing a project in groups, based on a driving challenge that they have to solve.
- Collaborative learning: a strong focus on group work.
- VR in Education: learning by virtual reality experiences.
- Peer Learning: Participants learn from peers and give each other feedback.
- Flipped Classroom: Participants master basic concepts by watching videos at home. In-class time is "re-purposed" for concrete application on problem-solving. Time spent in classroom is used to reflect, discuss and develop the research.
- Game Based Learning & Gamification: learning is mixed with games and game-like tools.

- Blended approach mixing STEM (Science, Technology, Engineering, Mathematics) & STEAM (also including Arts).
- Snack Learning: small and attractive bits of learning rather than pro-longed forms of study.
- Relevant Skills:
  - Metacognition– effective self-management of learning (time management, autonomy, discipline, perseverance, concentration), self-regulated learning (planning, monitoring and evaluating personal progress), critical reflection.
  - Digital Skills.
  - Leadership and management: set and meet goals, even in the face of obstacles and competing pressures; prioritize, plan, and manage work to achieve the intended result.
  - Responsibility in Research and Innovation (RRI).
  - 4Cs:
    - Creativity and innovation – creating new and worthwhile ideas individually and/or collaboratively and evaluating these ideas in order to improve and develop them into useful products/creations.
    - Critical thinking and problem-solving – using arguments, reasoning and analysis, appreciating different viewpoints to make judgements and conclusions, embracing curiosity to widen perspective and broaden knowledge, decision-making.
    - Communication – expressing oneself confidently and clearly in various forms and in a variety of situations, understanding others and considering different perspectives to formulate arguments.
    - Collaboration – working in diverse teams making use of differences to create new ideas, collaboratively planning and organising; inclusion, selflessness, integrity and ability to lead and follow others.

Known major constraints

- Pedagogical limits to designing online challenges and collaborative work.
- Technological constraints related to the tools used during the online collaborative challenge.
- Cultural and sociological constraints for the group to work on the challenge.
- Time constraints for participants to come up with a prototype easy to implement.

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Human-robot interaction

Prof. Joaquin L. Herraiz, Universidad Complutense de Madrid

Introduction to the problem

Human-robot interaction (HRI) constitutes a very active research field [1]. Interactions of humans with physically embodied robots create new challenges that involve numerous varied disciplines such as robotics, computer science, neuroscience, psychology, sociology, economics, etc. Robots will create a lot of new opportunities, but at the same time, a number of people feel a lot of anxiety about them. Numerous science-fiction novels have dealt with this topic [2,3], exploring their possible associated risks (in the majority of cases with catastrophic consequences).

There are different ways, in which robots can be designed, both regarding software and hardware. These decisions will significantly influence the manner people will perceive robots and the kinds of interactions they will have with them. As HRI seems inevitable, what can be done to facilitate these interactions, minimizing their risks and maximizing their benefits?

The main problem(s) explained

1. Perception problem - Robots may be considered a threat and they may provoke irrational fear or rejection. Some of these feelings are caused by the novelty of the issue (fear of the unknown), some may be caused by a lack of understanding of the manner robots operate.
2. Accessibility problem – The access to robots and their use may be really biased, leaving a significant part of the society and humanity behind. Elderly people, people with lower resources or education, low-income countries may encounter obstacles to the accessibility to robots, or they could resist accepting the interaction with non-human beings.
3. Unemployment problem – There is a reasonable concern/it is feared that robots may cause significant unemployment. A number of workers feel threatened by the loss of their jobs.

The most important objectives

1. Identify potential opportunities and problems in HRI (probably in the not-so-distant future). Evaluate their importance, impact on different levels (economic impact, sociological impact). Example: Shoper, a robot shopkeeper. This robot reduces costs, making the products they sell more affordable, but on the other hand, some customers are not willing to interact with Shoper.
2. Propose solutions that may help with the HRI, minimizing the risks, making it more integrative. Example: Is there any design adaptation that may reduce the resistance to HRI? Should robots look/sound like humans? Or is it better if they don't?
3. Evaluate the solutions and their impact. Find ways to evaluate the possible solutions, obtain feedback from multiple sources. The evaluation should be done not only from the technical point of view, but also from the point of view of their impact: Evaluate the ethical, sociological, economic implications of the solution. Example: Creating a survey of different looks, and voices for Shoper. Consider potential gender/race/age biases.

Audiences and expected value

HRI is expected to have a significant impact on all of us in the near future. The use of robots in many of our day-to-day activities is expected to continue growing in the next decades.

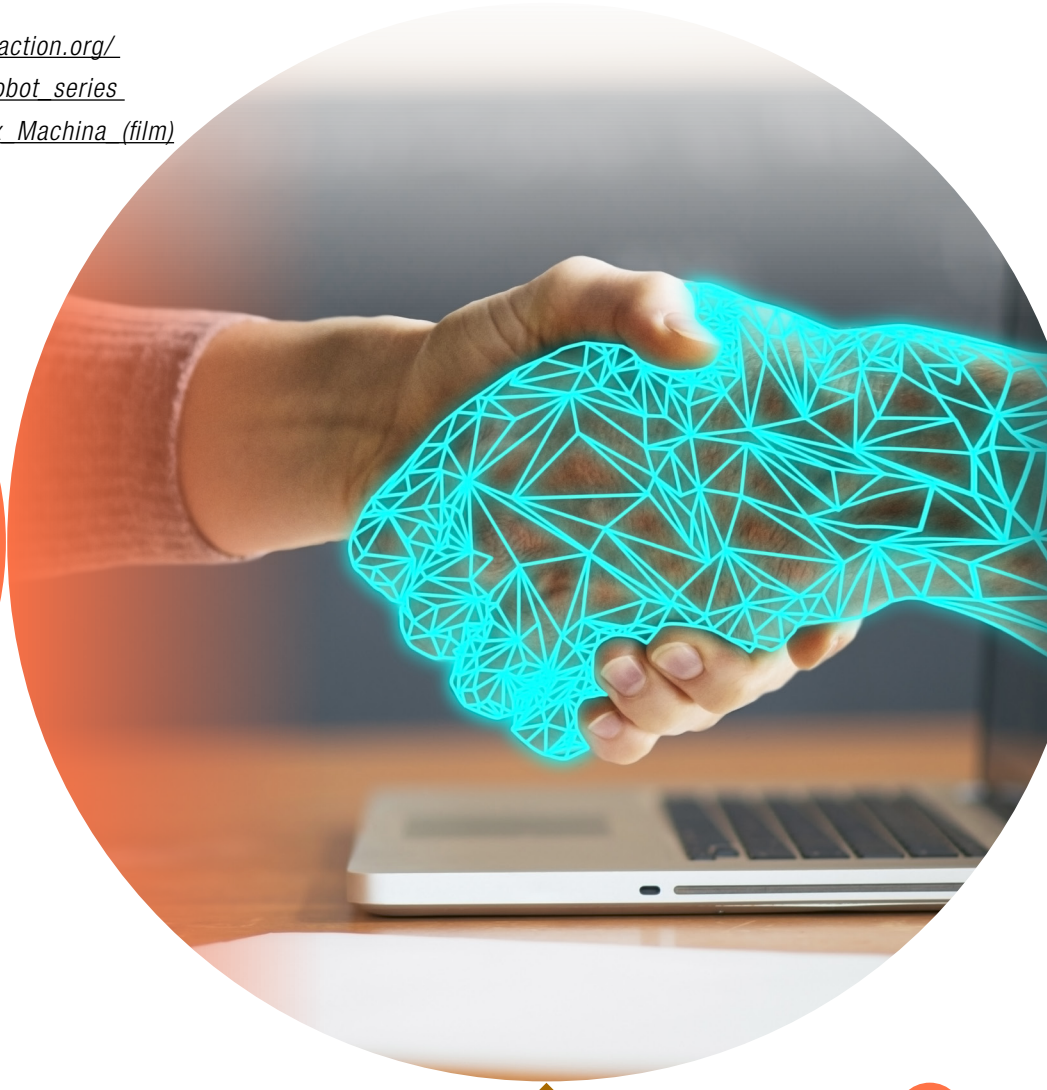
A healthy interaction with robots will bring enormous benefits to all population sectors. It may provide better health-care, reduce isolation, to name a couple. The expected value may vary depending on a particular case.

Known major constraints

- Psychological / Sociological Constraint: People may feel some intrinsic (irrational) fear of robots, fear of the unknown, which cannot be easily avoided. This may impose some serious challenges on any proposed solution.
- Accessibility Constraint (due to Age / Education / Resources): Not everybody will be regularly exposed to HRI.
- Time constraint: Maybe the advances are faster than they could be handled. The proposed solutions might become obsolete soon, as new technology becomes available.

Recommended sources of data

- *https://www.human-robot-interaction.org/*
- *https://en.wikipedia.org/wiki/Robot_series*
- *https://en.wikipedia.org/wiki/Ex_Machina_(film)*



Posthumanism, transhumanism and cyberfeminism

Prof. Dr. Asun López-Varela, Universidad Complutense de Madrid

Introduction to the problem

The development of artefacts and technology influences human cognition. This has been recognized in research on human evolution across various disciplines. However, since the 20th century tools and artefacts have become focused towards the digital and the virtual dimensions that coexist with physical life experiences.

Within the "Augmented Human" challenge, the focus on the posthuman, transhuman and cyberfeminist scenario merges STEM into STEAM presenting emotional engagement (fine arts) in relation to the socio-cultural implications of machine technologies, cybernetics and robotics. For too long we have been creating top-down fixed structures to explain our lives and our planet, trying to describe the world as a whole. We now need to recognize the urgency of focusing on conviviality across scales and develop new paradigms. In order to respond to the complexities of our times, it is crucial to move away from a mono-disciplinary approach, connect disciplines, and integrate personal expertise. Most topics are no longer confined to a single discipline but to several simultaneously. This integration of knowledge across boundaries was defined by Edward Osborne Wilson in 1998 as Consilience: The Unity of Knowledge. This challenge seeks to present a narrative that weaves human aspirations, speculative design, fine arts and engineering in search of augmented versions of the human. If we take a look at contemporary art, for instance, the focus has shifted from human to nonhuman.

But what is the nonhuman (vs. posthuman and transhuman)? And what is the Anthropocene? How does the human merge with nonhumans? (An example: Mez Breeze's poem below).

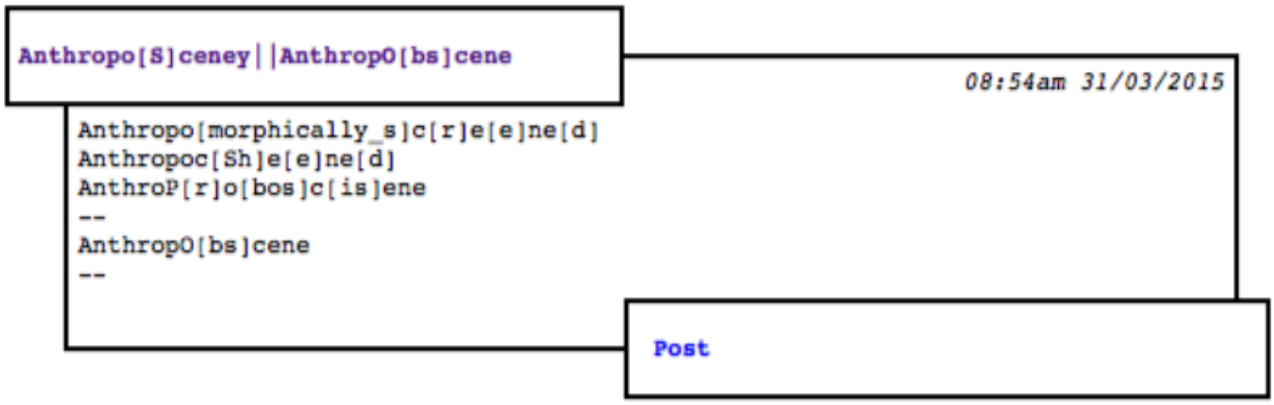


Figure 4. Mez Breeze' poem

The term Anthropocene has come to signify our current age in geological time. It marks the beginning of humanity's effects on the environment on a global scale. Coined by chemist Paul J. Crutzen and marine biologist Eugene F. Stoermer, the term emphasises human impact on the planet, characterized by encounters with nonhuman agents. However, in the Anthropocene, the need arises to also consider forms of agency that come from nonhuman entities, including the material inter-actions and intra-actions that occur between organisms and their environments.

The category of the nonhuman includes biological forms - animals, plants, microorganisms-, as well as non-biological entities such as machines and forms of AI (we should not forget that AI already powers social media platforms, search engines and other media tools which are already part of our lives). Some scholars have argued that AI might worsen earth problems rather than solve them (Harari 2015). Others defend that it could be used to model environmental systems and enable smart energy grids as a World Economic Forum blog proposes (Herweijer 2018).

Transforming scientific evidence into emotional realities, the mission of this challenge is to explore the impact of human actions and human extensions questioning our place in the contemporary global ecosystem. The challenge looks into what it means to be human today, implementing a consciousness of mutual species dependencies and including other (nonhuman) species in processes of geopolitical decisions. Working with the powers of speculative art (the use of science-fiction storytelling, RPGs – role playing games, diegetic artefacts and metamorphic metabolic design) the challenge seeks to make potential consequences of human impact on the planet tangible, and emotionally relatable to our reality.

The main problem(s) explained

The Augmented Human is perceived as a utopia (by transhumanists), a dystopia (by some posthumanists) and an opportunity by cyberfeminists.

While changes to the human may bring benefits, the dynamics generated by our impact on the earth's climate and ecosystems can unleash ecological effects that impact all aspects of human life. We are talking not only about human health (as seen during the Covid-19 pandemic), but also of food security, geopolitical and migratory flows, the restructuring of our societies and shared spaces, and so on.

This challenge contemplates the pros and cons of the Augmented Human scenario. While posthumanism reconsiders what it means to be human, transhumanism actively promotes human enhancement without measuring the risks.

Additionally, posthumanism denies that there is such a thing as a separate human nature. It is a denial of the limits between the human and the nonhuman. For posthumanism, technology defines hybrid human identity but it does not glorify its possibilities, as in transhumanism. Instead, it raises awareness on the inter-dependencies among species on the planet. Crossing paths due to increased use of technology or due to changed climatic circumstances means discovering new ways to navigate uncertainty.

The term, meaning ‘transitional human’, was used for the first time by Pierre Teilhard de Chardin in his 1949 book The Future of Man. Teilhard de Chardin was a French paleontologist and a Jesuit theologian who saw an evolutionary ‘telos’ in the development of an encompassing ‘noosphere’, a global consciousness, part of a single cosmos.

Transhumanists, however, believe that human beings will be able to transform themselves into different beings beyond what posthumanism tenets describe. Transhumanism began in the late 1960s when new concepts of the human were introduced and taught at The New School For Social Research (1919–1997) in New York City. Computer scientist Marvin Minsky wrote on relationships between human and artificial intelligence also in the 1960s, coinciding with the space race to put man on the moon and with the cryonics movement founded by Robert Ettinger. In the 1980s the University of California, Los Angeles became the main centre of transhumanist thought. In 1982, Vita-More authored the Transhumanist Arts Statement. In 1986, the Southern California offices of the Alcor Life Extension Foundation https://www.alcor.org/ became a centre for futurists. In 1988, the first issue of Extropy Magazine was published by Max More. In 1992, More founded the Extropy Institute, (in 2008 it became Humanity+). Extropy advocates a proactive approach to human evolution.

Finally, Donna Haraway used the term in her Cyborg Manifesto for feminist activism. For her, the cyborg metaphor embodies the nature of the posthuman ever-changing self. Haraway’s text was the foundational catalyst for the formation of cyberfeminism. It was later reprinted in Simians, Cyborgs and Women: The Reinvention of Nature (1991). She takes a utopian perspective on cyberspace as a means of freedom from social constructs such as gender, sexual difference and race. Haraway states that the cyborg “has no truck with pre-oedipal symbiosis, unalienated labour, or other seductions to organic wholeness through a final appropriation of all powers of the parts into a higher unity.“ She claims that technological developments are neither gender- nor race-neutral (Haraway 166) and envisages the future as a place where everything will depend on electronics. She finishes her manifesto with a sentence which has become popular within feminist theory: “I would rather be a cyborg than a goddess” (181).

The most important objectives

Definition of supporting strategies

- Put young people in charge of projects; build their mindset; foster grassroots projects that can create a certain impact.
- Support 4C reflective practices (Creative and Critical Thinking, Cultural Understanding, and Collaboration) and formalize a structure of cooperation through Design Thinking.
- Introduce concepts such as posthumanism, transhumanism and cyberfeminism and its relation to the Augmented Human Challenge and point out their main tenets and representative scholars and organisations.
- Design a social methodology to provide soft skills, encourage group engagement, self-organization, awareness and responsibility. Create a ‘manifesto’ of needs.

Help young people gain awareness

- Create mechanisms of ‘estrangement’ by means of speculative art in order to shake participants out of their comfort zones; awaken encounters with nonhumans; focus on inclusion (age, status, gender, disability, etc.) and introduce species interdependence; Understand the importance of working collaboratively and in an interdisciplinary way. Think outside the box.
- Reflect on the on the present, past and future of automata, robots, cyborgs and AI and consider how technological development influences the human world. Learn about posthuman culture and AI by means of exploring the world of automata in mythology and within the history of technology.
- Discuss topics such as decision-making in the digital world, technology & social inequality, posthumanism vs. transhumanism, ethics, law & policy, chips and implants, brain-computed interfaces, human-robot interaction, responsibility of autonomous agents, AI, neuro-ethics and robotics.
- Reflect on how humanoid robots can trigger empathic and emotional responses in humans can help reflect on how material aspects of design contribute to cognitive engagement.

Implementation

- Help participants to prototype ideas and share them in social networks (Instagram, YouTube, etc.).
- Help participants implement their prototypes and maintain the sustainability of their projects.

Audiences and expected value

- Students and Scholars from any field of knowledge.
- Innovation and entrepreneurship audience.

Main expected values

- Youth engagement and possible scalable ideas and projects.
- PBL (Project Based Learning). Participants learn by developing a project in groups, based on a driving challenge that they have to solve.
- Collaborative learning: a strong focus on group work.
- VR in Education: learning by virtual reality experiences.
- Peer Learning: Participants learn from peers and give each other feedback.
- Flipped Classroom: Participants master basic concepts by watching videos at home. In-class time is “re-purposed” for concrete application of problem-solving. Time spent in classroom is used to reflect, discuss and develop the research.
- Game Based Learning & Gamification: learning is mixed with games and game-like tools.
- Blended approach mixing STEM (Science, Technology, Engineering, Mathematics) & STEAM (also including Arts).
- Snack Learning: small and attractive bits of learning rather than prolonged forms of study.
- Relevant Skills:
  - Metacognition– effective self-management of learning (time management, autonomy, discipline, perseverance, concentration), self-regulated learning (planning, monitoring and evaluating personal progress), critical reflection.
  - Digital Skills.

- Leadership and management: Set and meet goals, even in the face of obstacles and competing pressures; Prioritize, plan, and manage work to achieve the intended result.
- Responsibility in Research and Innovation (RRI)
- 4Cs:
  - Creativity and innovation – creating new and worthwhile ideas individually and/or collaboratively and evaluating these ideas in order to improve and develop them into useful products/creations.
  - Critical thinking and problem-solving – using arguments, reasoning and analysis, appreciating different viewpoints to make judgements and conclusions, embracing curiosity to widen perspective and broaden knowledge, decision-making.
  - Communication – expressing oneself confidently and clearly in various forms and in a variety of situations, understanding others and considering different perspectives to formulate arguments.
  - Collaboration – working in diverse teams making use of differences to create new ideas, collaboratively planning and organising; inclusion, selflessness, integrity and ability to lead and follow others.

Known major constraints

- Pedagogical limits to designing online challenges and collaborative work.
- Technological constraints related to the tools used during the online collaborative challenge.
- Cultural and sociological constraints for the group to work on the challenge.
- Time constraints for participants to come up with a prototype that is easy to implement.

Recommended sources of data

Evolution of robotics

- *https://www.youtube.com/watch?v=uzM32wVTbsY*
- The book About Automata by Hero of Alexandria (c. 10 AD – c. 70 AD)

https://www.youtube.com/watch?v=wCRUX2Cgfa0 (4 min. documentary) including Leonardo Da Vinci's robot

- Banū Mūsā brothers and their Book of Ingenious Devices

https://www.youtube.com/watch?v=Vkac5Pg-7oE (documentary 3 min)

- Japan's "karakuri" puppets (Edo period (1603–1867) *https://en.wikipedia.org/wiki/Karakuri_puppet*

Android Theatre by Oriza Hirata, Hiroshi Ishiguro *https://archive.aec.at/prix/showmode/40911/*
part of Ars Electronica Archive *https://archive.aec.at/*

- Guinness collection of automata *https://www.youtube.com/watch?v=3-DCAiDZGnc*
- Al Jazari, father of robotics *https://www.youtube.com/watch?v=9q9G0S8fADQ*
- Jacques de Vaucanson (1709 –1782) *https://www.youtube.com/watch?v=HKIsOrhsLe8*
- The Tambourine Player and the Digesting Duck *https://www.youtube.com/watch?v=1TxrjpWGRXU*

Pierre Jaquet-Droz (1721–1790) and his writing automata. *https://www.youtube.com/watch?v=0ehTO9I1Hp8* (length 5 min)

- John Joseph Merlin (1735 –1803) The Silver Swan automaton

https://www.youtube.com/watch?v=whzoMIL-y3k

Robotic toys

- Lilliput, the first robot toy https://www.youtube.com/watch?v=mMiqmDE61hg
- Furby, Aibo https://www.youtube.com/watch?v=d0LGdhdvI4o

Uncanny Valley

- Thomas Kuntz's blood drinking automaton https://www.youtube.com/watch?v=rkDzDMcICBU
- The notion of "Uncanny Valley" https://en.wikipedia.org/wiki/Uncanny_valley
- E.T.A. Hoffman's short story "The Sandman", inspiration for Freud's uncanny
- 3D Animated Short: "PATCHWORK" - by ISART DIGITAL | TheCGBros

https://www.youtube.com/watch?v=mbsDtTjkbIo (8 min)

Why are humanoid automatons scary?

- https://www.youtube.com/watch?v=rSQAtBMTI1A

Robots and plant forms

- https://cordis.europa.eu/article/id/36559-building-a-robot-to-mimic-plants

Challenges posed in posthumanism and transhumanism.

- https://www.youtube.com/watch?v=mVTVe2hM0QY
- Microsoft Hololens (see min. 2) https://www.youtube.com/watch?v=SKpKlh1-en0

Differences between cyborgs, robots and androids

- https://www.youtube.com/watch?v=K2XGAkkitis

Transhumanism (Human enhancement or H+) vs Posthumanism

- Video 1 https://www.youtube.com/watch?v=zi6APy0oW9A
- Video 2 https://www.youtube.com/watch?v=I2J5EiB3vrA
- Video 3 https://www.youtube.com/watch?v=hm9zkvHVkL4

BBC News Transhumanism

- https://www.youtube.com/watch?v=STsTUEOqP-g
- Transhumanist Natasha Vita-More https://www.youtube.com/watch?v=oeVr7IGOh9o

Ecofeminism

- (optional video) Ecofeminist Rosi Braidotti at Harvard Univ. (1 hour)

https://www.youtube.com/watch?v=0CewnVzOg5w

Human-Animal Studies

- https://www.youtube.com/watch?v=eCaKVIIZf-Y

Artistic examples:

- https://flash---art.com/article/coactivity-between-the-human-and-nonhuman/
- Breeze. Mez (2020). V[R]erse http://mezbreezedesign.com/vr-literature/vrerses-xr-story-series/
- https://www.ted.com/talks/marina_abramovic_an_art_made_of_trust_vulnerability_and_connection

EU regulations on AI

- https://www.ai4eu.eu/news/new-frontiers-european-ai-regulation-how-we-are-moving-toward-trustworthinesst

4. 2. Solution space

eMoLens

- **Team:** Claudia Alea Parrondo (Universidad Complutense de Madrid), Amirreza Asayesh (Helsingin Yliopisto), Andy Cabello Bravo (Universidad Complutense de Madrid), Marcel GiovanettiDarienzo (Freie Universität Berlin), Pradeep Kumar (KU Leuven), Julia Rojo (Universidad Complutense de Madrid), Sofía Oriana Bozzo (Universidad Complutense de Madrid), Laura O'Sullivan (The University of Edinburgh) and Milena Ślósarz (Uniwersytet Jagielloński w Krakowie)
- **Facilitator:** Prof. dr. Asun López-Varela (Universidad Complutense de Madrid)
- **Author:** Prof. dr. Asun López-Varela (Universidad Complutense de Madrid)

The Augmented Human challenge provides an enhanced experience for visually impaired people visiting art museums in order to compensate their shortcomings in perceiving the aesthetic and emotional components in visual art.

A major implementer of synaesthesia, Wassily Kandinsky wrote that "Colour is the keyboard, the eyes are the harmonies, the soul is the piano with many strings. The artist is the hand that plays, touching one key or another to cause vibrations in the soul." Inspired by these words, the team worked to bridge engineering and art, STEM and STEAM, following EU guidelines for digital inclusion and technological accessibility. The end product was the creation of resin eMoLens Electrochromic Glasses. Designed to capture visual environment and convert it to other senses in order to help visually impaired museum visitors, these superlight minimal glasses use bone conducting sound and a micro-projector to transform visual experience into tactile impulses.

The software used includes Pathfinding, LIDAR, Painting recognition, Colour detection and band images, Histogram using colour bands, Colour to sound mapping, Scriabin and Rimsky-Korsakov technologies.

The challenge encompassed the prototyping of the glasses and a business model as well as seeking support from National Vision Foundations and similar entities which collaborated in testing (Acknowledgements to Isabel López-Varela, Miguel Coello and Sara de Piniés de la Cuesta). The end product allows expansion for investors through Crowdfunding and Kickstarter.

The Augmented Human challenge also included a bank of sounds and songs to accompany the aesthetic and emotional experience of the visually impaired.

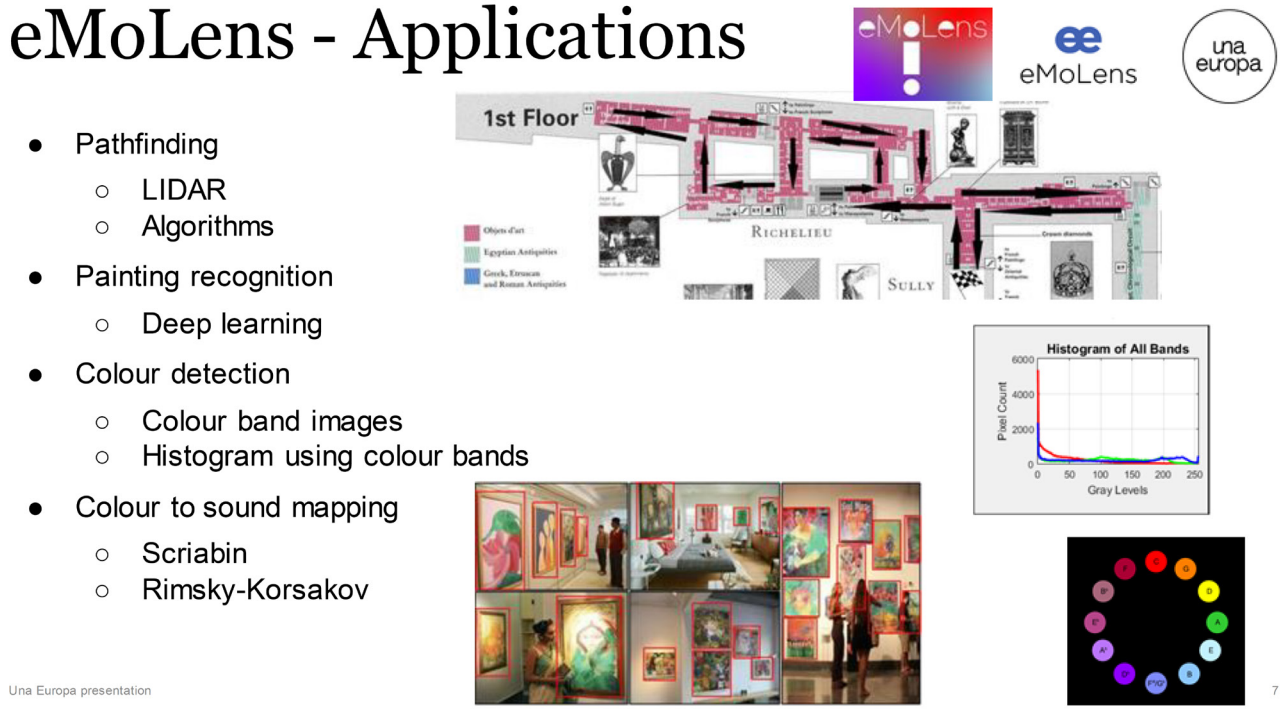


Figure 5. eMoLens prototype screenshot

Mirror - a new platform to gather and interact with information

Team: Shrikant Chitalkar (KU Leuven), Farida Shawky (KU Leuven), Diana Bianco (University of Edinburgh), Julian Kleber (Freie Univeristät Berlin)

Facilitator: Prof. Joaquin L. Herraiz, Universidad Complutense de Madrid, Tine Van Lommel (KU Leuven)

Author: Prof. Joaquin L. Herraiz, Universidad Complutense de Madrid

The Internet and web search engines have been available for more than 2 decades, and they have changed the way we connect with knowledge, information, learning, and people. During this time, an overwhelming number of available sources, such as websites, news, blogs and social media have become available, while, in contrast, the interface of web search engines and how people look for information and interact with it, has basically stayed the same.

This has resulted in the fact that nowadays it is very challenging to get a well-rounded understanding of a topic or event looking for information on the Internet. It requires a thorough comparison of websites and multiple searches using different keywords, which may yield confusion and frustration.

Thus, there is a need to present information in a more user-friendly and interactive way, which if solved, would have a huge impact on how people learn, and connect with knowledge and facts, while reducing the risk of bias and unreliable news. We present Mirror, a new platform to gather and interact with information, which provides a totally new user-experience. Users will be able to visually interact with the results of their search, which will be updated in real-time based on the reactions of the user and the semantic relations between the results. The platform will also provide enhanced options such as 3D visualization tools and Virtual Reality. This new platform aims to be a game-changer on how humans use computers to obtain knowledge.

Mitigating cyber threats

5

5. 1. Problem space

Consumers rights and digital contracts

Dr Ewa Laskowska-Litak, Uniwersytet Jagielloński w Krakowie

Introduction to the problem

In a research in 2008, Aleecia M. McDonald and Lorrie Faith Cranor showed that reading with understanding all privacy policies (PP) would take about 76 whole workdays, carrying time costs of approximately 201 hours a year and worth about 3,534 USD per American Internet user (with estimated value of time lost as about 781 billion USD annually). In 2016 an empirical survey of Internet of Things contracts showed that a purchase of a product may require a consumer to read almost a thousand legal documents, even if the subject of the purchase is a single home thermostat. In the same year a study on diabetes applications discovered that most of them (81%) did not actually have PP and among those which did, the collection of user sensitive health data was too extensive (80,5%) and in almost a half of the cases (48,8%) shared with unknown third parties. Among many issues relating to the consumer protection over the Internet, the rise of private ordering systems, extensive aggregation of services and sharing data are the most important and challenging issues.

The main problem(s) explained

The first problem is caused by long, complicated and often blurred legal documents that a consumer is required to read. Not only do contractual agreements not tend to use a unified language, names, titles or notions, but also, they are constructed as a web of dependable, interconnected legal instruments that create an autonomous legal system. Recent studies reveal that a vast majority of users (74%), after having sacrificed less than a minute, prefer selecting the acceptance button without reading the provisions, legally binding themselves to terms and conditions they are simply not aware of. It does nothing to prevent consumers from finding the legal provisions as nuisance,

complicated and simply unjust. A related problem is the interconnection of products/services. In order to have full access to a product's functionality (due to its interconnectivity with other digital equipment), a purchase of a single product is not enough: instead a consumer is forced to subscribe to services, buy additional products from the same producer, agree to share their data with unknown third parties, etc. The current legal model does not prevent this from happening since the basic paradigm of consumer protection is a lack of opportunity for authentic negotiation or customisation, thus digital business models are implementing a philosophy of adhesion: take it or leave it. Additionally, the interconnectivity between products is often justified on the grounds of intellectual property rights (IPR) that force consumers to purchase additional equipment and subscribe to services. Building upon an extorted consumer dependency, this model undermines the actual competition and with every new tech development or upgrade it strengthens digital addiction.

The most important objectives

The challenge's objective it to find appropriate balance between freedom of contract, consumer protection and interests of the state. Facing the economic justification and arguments favourable for business models, students shall consider measurements that will both: make the digital consumer protection more effective as it is (with regard to contractual agreements) and at the same time will not cause inappropriate obstacles for technological development and growth of the information society. Teams will face questions about how the digital consumer protection can be addressed with regard to the contractual freedom, IPR and a social responsibility of private law.

Audiences and expected value

Both the objective and research questions will attract attention from consumer organisations, lobbying groups, IP lawyers, IT specialists, etc. Digital consumer is of great relevance from the perspective of future EU legislation (e.g. Digital Service Act) and in the long term will also be addressed at the global level.

Known major constraints

Considering the rising development of social media, aggregation and sharing of big data, questions raised of consumer rights require a careful but interdisciplinary diagnosis since many of the previous legal instruments have failed. The differentiation of market, great variety of services/digital products, differences within business models might be an obstacle to finding a common denominator. Also, every new limitation to the broad catalogue of already existing provisions requires a special justification as a new exception to the general rule. Additionally, the IPR require a careful balancing of interests due to the fact that the legal framework might not exactly fit to the digital environment, nor does it consider consumers as the 'weaker' party. The data created by consumers-users are difficult to describe and its value is difficult to estimate if considered as single information.

Recommended sources of data

- Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on a Single Market For Digital Services (Digital Services Act) and amending Directive 2000/31/EC - COM(2020) 825 final.
- Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on contestable and fair markets in the digital sector (Digital Markets Act) - COM(2020) 842 final.
- Proposal for a directive of the European Parliament and of the Council amending Council Directive 93/13/EEC of 5 April 1993, Directive 98/6/EC of the European Parliament and of the Council, Directive 2005/29/EC of the European Parliament and of the Council and Directive 2011/83/EU of the European Parliament and of the Council as regards better enforcement and modernisation of EU consumer protection rules, COM (2018) 185 final.
- Mark Peacock et al., (External) evaluation of the Consumer Protection Cooperation Regulation, CONSUMER POLICY EVALUATION CONSORTIUM 60 (Dec. 17, 2012) *https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.362.7258&rep=rep1&type=pdf* compare: Ecorys and TNO: Study on future trends and business models in communication services, Study for the European Commission, 2016: *https://op.europa.eu/en/publication-detail/-/publication/ecf0bfc2-9aa9-11e6-868c-01aa75ed71a1*.
- Directive (EU) 2019/771 of the European Parliament and of the Council of 20 May 2019 on certain aspects concerning contracts for the sale of goods, amending Regulation (EU) 2017/2394 and Directive 2009/22/EC, and repealing Directive 1999/44/EC.

Cybercrime

Dr Milena Ingelevič-Citak, Uniwersytet Jagielloński w Krakowie

Introduction to the problem

High levels of digitalization and the transfer of a significant part of human activity to cyberspace have made the world increasingly more complex. Unfortunately, in this complexity, cybercriminal activities have also grown exponentially. Cybercrime poses a considerable threat on many levels, which is especially visible during the pandemic. As never before, cyberspace has become the place of work, education, entertainment, the space of various services (including even medical services), communication with others, and finally an essential source of information. As a consequence, we have become more vulnerable than ever to Internet threats, especially cybercrime.

There are two overarching areas of cybercrime:

- cyber-dependent crimes - offenses against the confidentiality, integrity, and availability of computer data and systems, where the devices are both the tool to commit crime and the target of crime.
- cyber-enabled crimes - traditional crimes that can increase in scale by using computers.

The first area mentioned above will not be covered here as this issue requires specialist technical knowledge. Attention will be focused on the crucial issue within the second area, namely content-related cybercrimes.

Content-related cybercrimes (i.e., illegal online content) take on a number of different formats, including:

- inciting violence or hatred.
- insulting or threatening individuals or groups.
- condoning crimes of genocide, crimes against humanity, and war crimes.
- disseminating or distributing such material.
- directing, supporting or taking part in activities of groups active in committing these offenses.
- child sexual abuse.
- terrorist content.
- fake news/disinformation.

The main problem(s) explained

1. Identification

What should be considered a content-related cybercrime, and how to identify illegal online content? Is it possible to standardise the concept of illegal content online, and how? It is worth emphasizing that value systems and legal systems differ extensively between societies. Web content that will constitute a severe criminal offense in one state may be entirely acceptable in another under freedom of expression.

2. Competencies and responsibility
Who is responsible for storing illegal content of the internet and who should be assigned the main competencies in this field in order to tackle this problem - state authorities, tech companies and service providers, international organisations, or specially appointed institutions?

3. Measures
What kind of measures should be introduced to prevent the uploading of this illegal online content effectively – legal, non-legal or both?

4. Human rights
The excessive monitoring of online content and the identity of Internet users can lead to severe violations of freedom of expression and the right to privacy. How to reconcile the need to identify and combat illegal content with the rights of cyberspace users?

The most important objectives

1. Broadening the knowledge of content-related cybercrime.
2. Discovering what solutions in the field of counteracting illegal online content have been imple mented and what is their effectiveness.
3. Identifying the main problems with combating illegal content.
4. Formulating a proposal for solving the problem within the selected content-related cybercrime type (e.g., hate speech or terrorist content, etc.).

Audiences and expected value

Audiences: Students and Academics of UNA Europa Universities.

Expected value:
1. Increasing university students' competencies in conducting research, data analysis, and providing solutions to complex interdisciplinary problems (content-related cybercrimes).
2. Enhancing multidisciplinary academic cooperation in the field of cybercrimes.
3. Broadening the knowledge of the cybercrime phenomenon with particular attention to content-related cybercrime.
4. Offering draft practical solutions that would help fight against selected types of content-related cybercrimes, and at the same time, respecting human rights.

Known major constraints

1. A consensus has not been reached on what should be regarded as illegal content, as a consequence, it is difficult to assess the essence and scale of the problem.
2. Experts adopt differing approaches to the legal regulations of a given threat and the scope of permissible interference in the sphere of user rights in cyberspace.
3. Content-related cybercrimes consist of numerous various behaviours (offenses) with specific characteristic features. Therefore, the development of an effective universal solution seems to be problematic. More targeted measures may be needed.

Recommended sources of data

Literature/publications

- M. Yar (2018). A Failure to Regulate? The Demands and Dilemmas of Tackling Illegal Content and Behavior on Social Media. International Journal of Cybersecurity Intelligence and Cybercrime, 1(1), *https://vc.bridgew.edu/cgi/viewcontent.cgi?article=1003&context=ijcic*
- European Commission, A Europe that protects: Countering illegal content online, 8.3.2021, *https://digital-strategy.ec.europa.eu/en/library/europe-protects-countering-illegal-content-online*

Websites

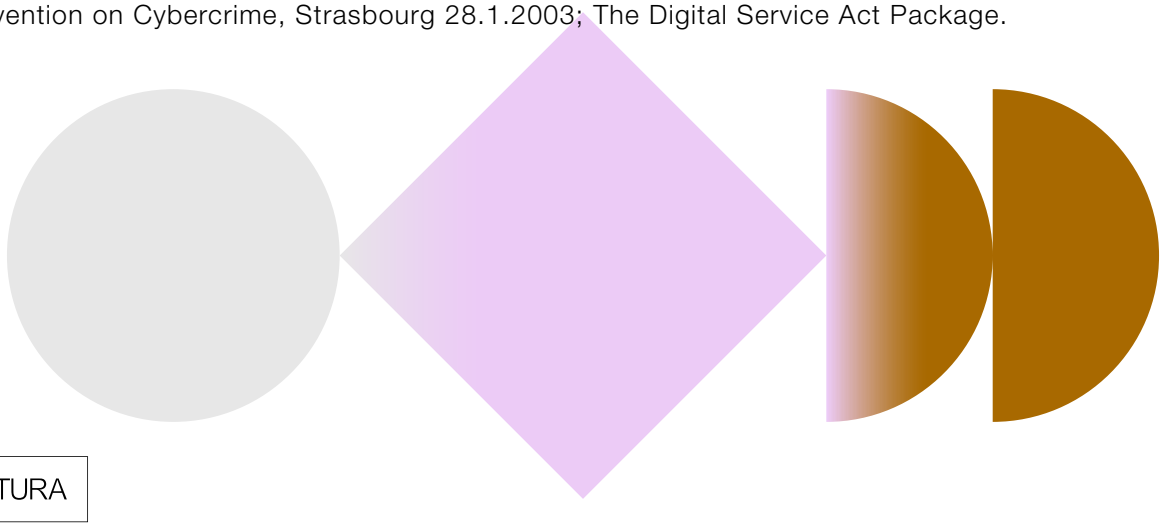
- Interpol, *https://www.interpol.int/Crimes/Cybercrime*
- Geneva Internet Platform DigWatch, *https://dig.watch/issues/cybercrime*
- Octopus Project Website: *https://www.coe.int/en/web/cybercrime/octopus-project*

Reports and studies

- Defreyne, A., et al. (2020). Online Platforms' Moderation of Illegal Content Online. Law, Practices and Options for Reform, Luxembourg, *https://pure.unamur.be/ws/portalfiles/portal/54626999/8590.pdf*
- International Telecommunication Union, Understanding cybercrime: Phenomena, challenges and legal responses, 2012, pp. 21-27, *https://www.itu.int/ITU-D/cyb/cybersecurity/docs/Cybercrime%20legislation%20EV6.pdf*
- Hoffman, A., Gasparotti A. (2020). Liability for illegal content online, *https://www.cep.eu/fileadmin/user_upload/cep.eu/Studien/cepStudie_Haftung_fuer_illegale_Online-Inhalte/cepStudy_Liability_for_illegal_content_online.pdf*
- Commission recommendation of 1.03.2018 on measures to effectively tackle illegal content online, C(2018) 1177 final, *https://digital-strategy.ec.europa.eu/en/library/commission-recommendation-measures-effectively-tackle-illegal-content-online*
- Europol (2020). Catching the virus – cybercrime, disinformation and the COVID-19 pandemic, *https://www.europol.europa.eu/publications-documents/catching-virus-cybercrime-disinformation-and-covid-19-pandemic*
- Europol (2019). Eurojust joint report, Common challenges in combating cybercrime as identified by Eurojust and Europol, *https://www.europol.europa.eu/publications-documents/common-challenges-in-combating-cybercrime*

Legislation

- Council of Europe Convention on Cybercrime, Budapest 23.11.2001; Additional Protocol to the Convention on Cybercrime, Strasbourg 28.1.2003; The Digital Service Act Package.



Fake news

Prof. Franciszek Czech, Uniwersytet Jagielloński w Krakowie

Introduction to the problem

At initial stage of the digital revolution, the vast majority of experts and public figures recognized a prodemocratic potential of the Internet. They believed that the ability to create independent websites and communication channels allows the breaking of the information monopoly of authoritarian regimes. President Bill Clinton in his speech delivered in March 2020 said: "In the new century, liberty will spread by cell phone and cable modem. (...) Now there is no question China has been trying to crack down on the Internet. Good luck! That's sort of like trying to nail Jell-O to the wall"[6]. The hopes suddenly vanished at some point with ongoing development of the Internet and social media. We are now aware that regimes such as China and North Korea are able to control, to a certain extent, the availability of the content shared via the Internet. Moreover, democracy is threatened by an enormous amount of fake news produced by professional troll farms. To imagine the scale of the deceptive industry, it is sufficient to note that 3,814 Russia-controlled Twitter accounts in 10 weeks affected the 2016 U.S. elections by posting over 175,000 tweets[7]. This kind of potential threat to the core democratic procedure of elections led to the FBI investigation and the U.S. Senate reports. However, the problem of misinformation is not limited to foreign activities, since there are also local conspiracy theorists, who are extremely suspicious toward the official media and state authorities and often promote fake news which may be seen as a basis for their radical ideologies. QAnon might be a fitting example here. As a consequence, social media with their echo chambers as well as fake news popularized by the Internet are increasingly perceived as a hotbed for political radicalization, social fragmentarization, polarization, stereotyping, and a new wave of populism. As such they constitute a challenge for modern democracies. According to Jonathan Taplin from the University of Southern California "Social media will continue to enable new and more-sophisticated forms of propaganda and disinformation. Artificial intelligence will enable deepfake videos that the average citizen will be taken in by. Facebook, YouTube, and Twitter will continue to enable this content in their unending chase for revenue. Politicians will make noises about regulation, but since these platforms will become their primary source of advertising and publicity, they will never commit to the elimination of Safe Harbour and other rules that protect social networks"[8].

The main problem(s) explained

Bill Clinton, as exemplified above, was one of the many who believed that easy access to information via the Internet will strengthen democratic systems. In this context fake news seems to be the game changer. A growing number of public figures realize that something needs to be done to limit the misinformation that has tremendous impact on social and political life. Well established democracies

6 https://archive.nytimes.com/www.nytimes.com/library/world/asia/030900clinton-china-text.html
7 https://www.buzzfeednews.com/article/ryanhatesthis/mueller-report-internet-research-agency-detailed-2016
8 https://www.pewresearch.org/internet/2020/02/21/concerns-about-democracy-in-the-digital-age/

(such as France or Germany) have implemented new law and policies to deal with this problem. However, these kinds of governmental actions bring to mind the restrictions of freedom existing in authoritarian regimes. Suspicious citizens and conspiracy theorists point out that both fake news and the problem of foreign misinformation are used to limit their freedom. In such a context, the question arises: what should be done to limit the amount of fake news circulating in the public sphere without limiting the freedom of speech?

The most important objectives

The challenge's objective is to build a multidimensional counter-fake news action plan. It should outline the essential actions needed to reach the goal, but particular attention should also be paid to make sure that freedom of speech is not limited (or, if it is limited, it should be carefully explained and justified). The initial problem boils down to the fact that fake news distributors and conspiracy theorists often claim to be citizen journalists, as they provide independent and critical news. Hence, the action plan should start with an operational definition of fake news, which allows for the case-by-case determination whether or not a particular piece of information is undesired fake news, which is then going to be de-mainstreamed. As a multifaceted kind of strategy, it can include a broad range of various actions: legal, fiscal, international, educational, or media-related. At the same time, it should also be as specific as possible. It, for example, is not enough just to obligate social media platforms (e.g., Facebook, Twitter) to limit the amount of fake news available on their sites. More precise instructions should be provided too: what kind of information should not be published or promoted. Additionally, the plan may contain a justification of particular actions in order to attain public endorsement. Last but not least, the plan might also include a discussion on potential obstacles, outcomes and side effects of the proposed measures.

Audiences and expected value

The action plan with recommendations on countering fake news can be of great interest to policymakers from various states. The potential audience of such an expertise will also include the media and civil society organisations dealing with radicalization, populism, disinformation as well as democracy, freedom of speech, and digital activism. It is worth noting that some audiences may be critical readers of the plan, especially when it postulates a limitation of the freedom of speech or other civil liberties. Everything should be done to make the plan useless for authoritarian politicians. Such a plan will be only valuable as prodemocratic expertise, which allows the understanding of challenges of contemporary democracy in the age of social media.

Known major constraints

The most important constraint has been already stated: the measures to counteract fake news should interfere as little as possible with the freedom of speech, which is recognized as a fundamental democratic principle. Another constraint that has to be considered deals with the question of privatization of policing the public sphere. In other words: can Internet corporations become judges of free speech and block some users without a court verdict?

Recommended sources of data

An overview of existing reports and articles is a good starting point, but fresh ideas are the most valuable. Students are welcome to conduct their research with the following reports and articles:

- Alemanno, Alberto (2018). How to Counter Fake News? A Taxonomy of Anti-fake News Approaches, European Journal of Risk Regulation, 9, p. 1-5.
- Brown, Ninaand Jonathan Peters (2018). Say This, Not That: Government Regulation And Control Of Social Media, Syracuse Law Review, *https://lawreview.syr.edu/wp-content/uploads/2018/10/I-Brown-and-Peters-FINAL-v3.pdf*.
- Initiatives to Counter Fake News in Selected Countries, Report, Library of Congress, 2019, *https://www.loc.gov/law/help/fake-news/index.php*
- Guide to Conspiracy Theories, COST Action Comparative analysis of conspiracy theories in Europe (2020). *https://conspiracytheories.eu/education/guide-and-recommendations/*
- Tambini, Dominic (2017). Fake News: Public Policy Responses. Media Policy Brief 20. London: Media Policy Project, London School of Economics and Political Science, *https://blogs.lse.ac.uk/mediapolicyproject/*

Bartosz Janik, Copernicus College

Introduction to the problem

1. Due to the COVID-19 pandemic, full or partial lockdown measures affected almost 2.7bln workers worldwide (71% of the total world's workforce) (ILO Monitor: Covid-19 and the world of work, 2020; Georgiadou, 2021).

2. The EUROPOL report from 2020 – Pandemic profiteering: how criminals exploit the COVID-19 crisis indicated that the COVID-19 crisis had been used to carry out social engineering attacks, phishing emails through spam campaigns, and business email compromise (EUROPOL, 2020). One of the often-cited reasons for this increased activity is the potential weakness of teleworking.

3. This potential weakness is usually connected with the use of work devices for private purposes. HP WOLF Security report estimated, the survey conducted among the workers (or members of their household), that 55% of them used work devices for opening personal email attachments or web pages, 33% downloaded files from the internet, 52% of them used company laptops for online shopping and internet browsing. The list of potentially risky behaviours run and run, and in the preliminary finding it is indicated that working from home significantly enhanced workers' susceptibility to cyber-attacks due to those risky behaviours.

4. Furthermore, workers let other members of the household use their work devices. This includes downloading third-party software and installing it on those work devices. This creates the opportunity for potential security breaches and data leaks that might compromise the company's security and the worker.

5. Apart from the increase of traditional attacks, working from home during the COVID-19 pandemic created new threats and unique strategies employed by cybercriminals. This includes (Weil & Murugesan, 2020):

• ZOOM bombing: trolling hackers intercept authentication credentials and inject objectionable content (such as pornographic materials and violent images) into seemingly secure collaborative online meetings.

• COVID-19 Phishing attacks: fake, malicious emails that appeared to be from the Center for Disease Control (CDC). They contained malware attachments or aimed to hijack user credentials.

Malware: Corona Trojan Most important objectives Detailed assessment:

• Cybersecurity risks are more common in the sectors not directly related to information technology. What is more, online education is a target (lower security standards in Academia).

• Reports indicate that older workers are more prone to risky behaviours than others, and they are the main target of cybersecurity threats (knowledge and work culture).

• Working from home has in many cases caused that the boundaries between work and private life become blurred. This contributed to the extensive use of work devices for private purposes, which created the potential risk of compromising the company's security.

• Despite present security protocols, risky behaviours might be connected with private use of the

working device (also by other members of the household).

- Security protocols are usually in the form of written guidelines and not connected with proper training.

Possible research problems

It seems that the issue is not only technological (IT security measures), but psychological and sociological factors might contribute (work-life balance) as well. The problems might be approached from several perspectives:

- Empirical analysis of the threats and empirical assessment of how personal traits of workers might contribute to the facilitation of increased susceptibility to cyber threats.
- Economic analysis of legislation that might further ensure proper security measures on a global level.
- Legal analysis of possible countermeasures.

The potential research areas include:

- Conducting a poll amongst home workers about possible risky behaviour to construct security protocols. Detailed demographic analysis and identification of the contributing factors.
- Identifying core risky behaviours by monitoring the networks and work devices to set additional security protocols.
- Assessing work-life balance of home workers and possible changes due to home working environment. The analysis of nudging techniques employed by employers.
- Introducing novel legislation: assessing the possible models of legislation to ensure further security and justification of the possible solutions. The relation between global regulation and models of implementation of the general rules.

Recommended sources of data

Literature

- Georgiadou, A., Mouzakitis, S., & Askounis, D. (2021). Working from home during COVID-19 crisis: a cybersecurity culture assessment survey. Security Journal, 1-20.
- Pranggono, B., & Arabo, A. (2021). COVID-19 pandemic cybersecurity issues. Internet Technology Letters, 4(2), e247.
- Weil, T., & Murugesan, S. (2020). IT Risk and Resilience-Cybersecurity Response to COVID-19. IT Prof., 22(3), 4-10.
- Williams, C. M., Chaturvedi, R., & Chakravarthy, K. (2020). Cybersecurity risks in a pandemic. Journal of Medical Internet Research, 22(9), e23692.
- Wirth, A. (2020). Cyberinsights: COVID-19 and what it means for cybersecurity. Biomedical instrumentation & technology, 54(3), 216-219.

Reports

- HP Wolf Security Blurred Lines and Blindspots
https://press.hp.com/content/dam/sites/garage-press/press/press-releases/2021/wolf-security-and-flexworker/2021_HP_Wolf_Security_Blurred_Lines_Report.pdf
- Pandemic profiteering how criminals exploit the COVID-19 crisis. March 2020
https://www.europol.europa.eu/publications-documents/pandemic-profiteering-how-criminals-exploit-covid-19-crisis

5. 2. Solution space

PhisherMan

Team: Andrea Mengascini (Università di Bologna) and Dionys Nabarro (KU Leuven)

Facilitators: Karen Simons (KU Leuven), Marrit Vandenheuvel (KU Leuven), Gaël Janssens (KU Leuven)

Authors: Karen Simons (KU Leuven), Marrit Vandenheuvel (KU Leuven), Gaël Janssens (KU Leuven)

In the Una.Futura challenge we had the opportunity to develop an idea to counter the cyber threat of phishing.

In recent years phishing has been skyrocketing, even more with the adoption of smart working due to the Covid pandemic. In 2020 alone the money lost worldwide due to phishing was around 1.8 Billion dollars.

While in companies and organisations there already exist courses and specific training to detect and mitigate the effect of phishing, most users who are not part of an organisation can still be harmed.

Our core mission is to create a platform to help people to discern tentative phishing.
PhisherMan, our application, uses a reward system and gamification system to make users learn to catch a phish.

Our training platform lets the users see an example of real and fake messages and quiz them to test their knowledge. During this training, our software explains to them the main characteristics of a message to watch out for.

Infodemic – a tool to deal with fake news

- **Team:** Giorgia Fiocchetti (Università di Bologna), Lucía Carrasco Rodríguez (Universidad Complutense de Madrid), Marion Colin (Université Paris 1 Panthéon-Sorbonne), Delacotte Maxime (Université Paris 1 Panthéon-Sorbonne)
- **Facilitator:** dr Marcin Jarząbek (Uniwersytet Jagielloński w Krakowie)
- **Author:** dr Marcin Jarząbek (Uniwersytet Jagielloński w Krakowie)

The internet has dramatically accelerated the circulation of fake news and conspiracy theories, and they have become a severe threat to democracy and public health, especially during the COVID-19 pandemic . Several public policies have been implemented in different countries, but mostly without success. That is why our solution proposes another way of dealing with them: easy access to fact-checking and legitimate knowledge through the application called Infodemic.

The goal of Infodemic is to find a general solution to treat risky fake news directly during the pandemic without suppressing freedom of expression. At the same time, we are trying to educate young adults (our target group) to make a habit of double-checking the information they find on the internet.

Infodemic will be available for download free of charge from your regular app store. After downloading, you can create an account to access all functionalities. You will also find an info section and a tutorial (both optional) to guide you through all the functionalities of our app.

Users can directly access it from an article/social media to see if the information content has been reviewed. You can report questionable content for a review, and the app will certify its credibility or mark the news as false. The app will provide you with information regarding your home country, but you can easily look up the international section, switch countries, and change languages.

Infodemic uses tools of gamification and offers its users a reward system. You can gain points to level up and get prizes by swiping left and right the news (true/false) and by using other sections like the chat or Q&A section.

The mission of the app is to combine emotional involvement with credible knowledge.

Figure 6. Infodemic prototype screenshots

Improving mental well-being and social relations in the digital world

6

6. 1. Problem space

Digital communication in times of crisis

Dr Marta Silvera-Roig, Universidad Complutense de Madrid

Introduction to the problem

The global pandemic has affected us all in unexpected ways. One of the largest current concerns relates to the effects of the Covid crisis on our mental health. There are a number of ways we refer to the virus, amongst which is the use of the war metaphor in such a way that the virus is compared to an enemy, and the ways of dealing with it are weapons.

In the digital press and in social networks, such as Twitter (the case of #reframecovid), it has been suggested that the use of some metaphors is more appropriate than the use of others depending on their emotional impact.

Conceptual metaphor theory and new advances in neuroscience can help shed light on this linguistic debate.

Undifferentiated emotion cognition, emotion is present in all brain structures.

Different social conceptualizations create different narratives and sometimes there are dissonances between personal and social narratives, we can approach that through analysing concepts (image schemas, conceptual metaphors, blending theory).

The main problem(s) explained

According to the Conceptual Metaphor Theory, language does not contain meaning, it guides it. Cognition is pre-linguistic and through the process of language we conceptualize some domains in

terms of others, for example when we say that a love relationship is wrecked, we would be activating the conceptual metaphor LOVE IS A JOURNEY.

By observing the conceptual metaphors that we use, we can obtain valuable information about unconscious conceptualizations of reality in a given context. The metaphor is not a literary device, it is a cognitive tool that we use continuously, exploiting its limitless creativity in spontaneous conversations and writing.

The problem with initiatives such as #reframecovid (Twitter) or criticism in the digital press towards the use of certain metaphors is that the emphasis is on linguistic expression, in a prescriptive way. An attempt is made to prescribe metaphors, as in the case of A 'METAPHOR MENU' FOR PEOPLE LIVING WITH CANCER (http://wp.lancs.ac.uk/melc/the-metaphor-menu/). To what extent can we alter reality by changing language? Can language serve as a masker of various problems such as is the case of "toxic positivity"?

The most important objectives

- Do we know the difference between metaphorical linguistic expression and conceptual metaphor?
- What metaphorical linguistic expressions and conceptual metaphors have been used in digital media to refer to the pandemic from its beginning until now?
- What effect, if any, might the use of some conceptual metaphors have on our mental health?
- Should we censor the use of metaphors, such as the ILLNESS IS WAR metaphor, because they negatively affect our perception of a health crisis?

Audiences and expected value

The description of the use that we make of language as a community can help health and communication professionals to have a broader vision of a health problem.

As a society we can all benefit from getting to the real problem behind linguistic expressions to solve a deeper problem rather than staying on the surface and just changing the way we express ourselves. This should, instead, serve to identify health problems, and as an indicator of various emotional states.

It is not enough to modify language to change reality.

Known major constraints

Certain pseudoscience, such as "neurolinguistic programming", distracts from important advances in neuroscience. It is essential to learn to distinguish real research on the mind from neuro-opportunists.

Initiatives carried out by linguists, such as those mentioned above, may be well-intentioned, but they make the mistake of regarding thought and language as indistinguishable.

We need to integrate new advances in Affective Neuroscience to underline the importance of mental health in all areas.

Recommended sources of data

- YouTube Lecture: Covid-19 and Conceptual Metaphor Theory: DISEASE IS WAR: *https://www.youtube.com/watch?v=jyiWRpd_3qU*
- Conceptual Metaphor in Everyday Language (George Lakoff and Mark Johnson): *https://www.jstor.org/stable/2025464*
- We Feel, Therefore We Learn: The Relevance of Affective and Social Neuroscience to Education: *http://lchc.ucsd.edu/MCA/Mail/xmcamail.2007_03.dir/att-0156/01-Yang_Damasio_MBE.pdf*
- Language may indeed influence thought: *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4628110/*
- Emergent processes in cognitive-emotional interactions: *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3117594/*
- #reframecovid: *https://sites.google.com/view/reframecovid/*
- A Metaphor Menu for people living with Cancer: *http://wp.lancs.ac.uk/melc/files/2019/10/Metaphor-Menu-for-People-Living-with-Cancer-A4-Leaflet.pdf*
- Does the COVID-19 war metaphor influence reasoning? *https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0250651*
- War metaphors used for COVID-19 are compelling but also dangerous: *https://theconversation.com/war-metaphors-used-for-covid-19-are-compelling-but-also-dangerous-135406*
- ¿Guerra contra el Covid-19? No culpes a la metáfora. *https://blogs.elconfidencial.com/tecnologia/tribuna/2020-04-29/guerra-covid-19-metafora_2570808/*
- Global Crisis: War Against an Invisible Enemy? Don't Blame the Metaphor *https://www.researchgate.net/publication/348372400_Global_Crisis_War_Against_an_Invisible_Enemy_Don't_Blame_the_Metaphor*

Loneliness & depression

Dr Brian Cahill, Governing Board, Euroscience, TIB Leibniz Information Centre for Science and Technology
Dr Gábor Kismihók, TIB Leibniz Information Centre for Science and Technology
Dr. Stéphanie Gauttier, Grenoble École de Management
Dr. Janet Metcalfe, Vitae
Dr. Stefan T. Mol, University of Amsterdam
Dr. Darragh McCashin, Dublin City University

Introduction to the problem

Mental health issues present a significant challenge in the EU. A systematic review of data across the EU, Norway, Iceland and Switzerland by Witchen & Jacobi (2005) showed that more than a quarter (27%) of the adult population had experienced mental health disorders in the previous year - which would be an estimated 83 million people. This finding is corroborated by the latest Eurostat data which suggest that 4% of all deaths in the EU in 2015 resulted from mental and behavioural disorders; and that in 2014, 7% of the EU population reported having chronic depression. This challenge is also present within the research community. A review by Levecque et al. (2017) across different occupational groups suggests that academics are among the occupational groups with the highest levels of common mental disorders (alongside social services staff and teachers). The review estimated the prevalence of common mental disorders among academics and teachers at 37%, compared with a prevalence of approximately 19% in the general population. Across a number of studies based on the GHQ-12, a well-validated screening tool for psychological distress, the evidence suggests that between 32% and 42% of academic employees are 'at risk of having or developing a common psychiatric disorder'. A number of studies have looked at this issue specifically for postgraduate students, finding similar levels of mental ill-health.

The main problem(s) explained

Research evidence consistently highlights the negative impact of low levels of wellbeing and mental health on individual, team, and organisational performance, thereby triggering significant costs for all stakeholders. Work-related stress can lead to lower levels of commitment not just to the institution, but also to research careers, which can be seen in high levels of dropout and turnover. Work-related stress can also impact on life outside of work, limiting the ability of researchers to perform their family and social roles; and leading to irritability, withdrawal, and sleeping difficulties. Furthermore, it has been shown that institutional context, organizational structure, culture, as well as managerial practices all have a significant impact on various mental and physical health domains of employees. Therefore, there is an urgent need to generate insight into the contextual antecedents and covariates of mental health and wellbeing in academic workplaces.

Key objectives

The COST Action Researcher Mental Health (ReMO) aims to:

1. Establish a sustainable research network that includes multiple stakeholder groups (researchers from different disciplines and career stages, practitioners, employers, civil society representatives) from different countries, with a common goal of identifying the key issues relating to mental health and wellbeing provision in academia and recommendations for institutions and policy makers.
2. Collect and synthesise existing knowledge, information, data, and evidence gaps on antecedents of the mental health of academics across countries and systems and associated support services - including funding structures, career pathways, workplace policies, and socio-political barriers and legislative differences across countries.
3. Develop a strategic, coordinated, interdisciplinary, and comparative research agenda that prioritizes the most urgent research gaps and questions that cannot be answered from existing data sources. Bring together researchers from rarely linked research areas (e.g. Psychology, Higher educational Policy, Computer Science, etc.) who focus on different aspects of mental health and wellbeing (e.g., policies, institutional barriers, effective practice, social and workplace discrimination, job search and employability, well-being and distress, and skill mismatch), in order to answer overarching and substantial questions.
4. Support both theoretical and practical knowledge, evidence, and information exchange across the network of stakeholders, disjointed disciplinary areas, and countries. Foster collaboration between multiple fields in which aspects of mental health and wellbeing are studied, with a particular focus on connecting researchers, practitioners, civil society representatives, and employers to identify effective practice and produce actionable outcomes.
5. Transfer and apply evidence-based insights and intervention requirements through robust dissemination protocols and an evidence-based forum. Involve practitioners, institutional policymakers, institutions, and civil organisation representatives, in order to facilitate the creation of a continuous feedback loop between different actors. Increase awareness and educate stakeholders on how they can effectively support mental health and wellbeing of researchers at the individual and organisational levels.
6. Contribute to building the research capacity of at least 100 Early Career Investigators to serve as ambassadors for mental health and wellbeing in their organisations and communities. This is done by organising at least five workshops and three Training Schools.
7. Offer a wellbeing and mental health support network for Early Career Investigators (ECIs), especially for ECIs confronted with less developed infrastructure in the domain.
8. Stimulate research-practice exchange, foster co-development of knowledge, skills, and output co-creation in the area of researcher wellbeing and mental health by: a) offering short-term research visits for researchers to stakeholder organisations; b) offering the network at least one high quality training for research team leaders in HE.

Audiences and expected value

Bring together stakeholders from academic institutions, practitioners, private sector, civil society, research management, career advice, research funding, policy making and researchers, to actively

and effectively exchange input on experienced challenges, best and worst practices, knowledge gaps and needs. Create institutional links for the regular transfer of knowledge and best practices between countries that have a leading role in the field, such as the UK, Belgium, or the Netherlands; but have different levels of wellbeing service development, both with regard to policy and research.

Known major constraints

Mental health is a taboo topic in many countries and workplaces and people suffering poor mental health are often stigmatized. Academic workplaces are no different and many researchers are reluctant to recognise issues with their own mental health and delay or avoid seeking help. The ReMO project is raising awareness of mental health issues among researchers in a way that reduces stigma and encourages discussion.

Some institutions are reluctant to address problems related to the wellbeing of their early career researchers. The ReMO projects aims to work with institutions through gathering evidence of the extent of the issue and by assessing the effectiveness of various practices carried out at partner institutions within our network.

Policy makers may see mental health issues as being strictly an individual or institutional issue. Nevertheless, it is clear that policy makers, research funders, publishers, and accreditation organizations alike have great power to systemically influence our research culture. Such initiatives have in the past been taken by the European Commission through the adoption of the European Charter for Researchers and a Code of Conduct for the Recruitment of Researchers in 2005. In recent years, the Welcome Trust has led an initiative to foster a more positive and inclusive research culture. We are in the process of involving policy makers and other stakeholders in our project.

Recommended sources of data

The ReMO Project is collating an evidence hub of academic papers, news articles, data sets, presentations, reports, online resources and other forms of evidence related to the mental health of researchers. This resource can be accessed here:
https://www.zotero.org/groups/2521493/researcher_mental_health/library

Selected literature:

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• Bleasdale, B. (2019). Researchers Pay the Cost of Research. Nat. Mater. 18 (8), 772–772. *https://doi.org/10.1038/s41563-019-0443-z*.

• Wittchen, H. U., & Jacobi, F. (2005). Size and burden of mental disorders in Europe—a critical review and appraisal of 27 studies. European neuropsychopharmacology, 15(4), 357-376.

• Satinsky, E.N., Kimura, T., Kiang, M.V. et al. (2021). Systematic review and meta-analysis of depression, anxiety, and suicidal ideation among Ph.D. students. Sci Rep 11, 14370. *https://doi.org/10.1038/s41598-021-93687-7*

Blockchain-based health data management

Dr Fabian Rappert, Freie Universität Berlin

Introduction to the problem

The department at the FUB, led by Prof. Gersch, has a working group as a member of the BMBF-funded joint project "BloG³" (project duration: 03/2020 - 02/2023). BloG³ brings together 10 interdisciplinary partners from the fields of medicine, research and industry (in addition to FU Berlin, Charité Berlin, Pflegewerk Berlin, KIT, FZI, etc).

The goal of this project is the development of a blockchain-based digital platform offering a decentralised data and rights management system for the creation of a holistic health profile (integration and aggregation of fragmented health data). The overarching goal is to ensure digital patient independence through self-determined data management.

The main problem(s) explained

Since 1st October 2017, hospitals have been legally obliged to disclose relevant health information in a structured form within the framework of discharge management to ensure needs-based and continuous care following hospital treatment. In case of (intersectoral) transfer of a patient, e.g. to rehabilitation, care or the home environment, as well as in cases of interdisciplinary treatment by several actors, there are often media and information breaks. Consequently, relevant information about patient care may be missing.

Additionally, patient-related data are collected by different institutions and actors and are stored in heterogeneous systems. Therefore, patients oftentimes discover that the system only provides them with fragmented information.

The most important objectives

1. Working in cooperation with the Charité on the development of the digital platform "BloG³".
2. Consultation with the cooperation partner Charité on one of the three given topic options:

- Blockchain and interoperability.
- Business model analysis of blockchain-based health applications.
- Governance changes through the use of Blockchain.

Advanced Option 1 - Blockchain and Interoperability

As part of the BloG³ research project, the task is to carry out the technical development of the BloG³ platform using blockchain or distributed ledger technology. The entrusted task will include addressing technical challenges of developing such data and access rights management system,

especially with regard to the topics of interoperability and interfaces.

Building on this, the task is to concretise the development of the BloG³ application, taking into account the advantages of blockchain technology.

- 30%: Research and discussion on technical challenges / integration hurdles in the health sector.
- 40%: Research on Blockchain / Distributed Ledger Technology.
- 30%: BloG³ interoperability concept.

Advanced Option 2 - Business Model Analysis of Blockchain-based Health Applications

As part of the BloG³ research project, the task is to carry out research into ensuring the maximisation of economic utilisation of the developed BloG³ platform. This is essential for the sustainable and lasting implementation of the developed solution in a changing healthcare system.

The entrusted task will include designing suitable and viable business model options for the BloG³ solution.

- 30%: Research into blockchain-based business models in the electronic health record sector.
- 40%: Business model analysis for BloG³.
- 30%: Positioning of BloG³ as an E-Health application in a health care market of your choice.

Advanced Option 3 - Governance changes through the use of blockchain

As part of the BloG³ research project, the assessment of the economic implications of the BloG³ platform through the use of blockchain and distributed ledger technology will be commissioned.

The entrusted task will include analysing the changes in incentives and governance structures as a result of the use of BloG³ from the perspective of relevant stakeholders.

- 30%: Research on governance.
- 40%: Analysis of governance changes through the use of blockchain.
- 30%: Stakeholder-differentiated analysis of changing governance.

Audiences and expected value

Transparency

- There is no longer any need for intermediaries to be trusted to carry out their tasks.
- Direct data exchange between non-trusting parties is possible.
- The sender and the location of transferred data can be traced through chain transactions.

Data security: protection against forgery

- The use of cryptographic procedures makes it almost impossible to subsequently change or delete stored transactions.

Data security: Access protection

- The use of digital signatures to encrypt and decrypt data (private & public key).
- The possibility of accurate verification, transaction tracking and accesses.

Recommended sources of data

- Sunyaev, Ali (2019): Eine Einführung in die Distributed Ledger Technology (Blockchain - 'Like a Locked Train') *https://aifb.kit.edu/images/b/b0/Blockchain.Like.a.Locked.Train.Brochure.pdf*
- Sunyaev, Ali (2018) What is DLT? What is Blockchain? What is Bitcoin - Vortrag auf der "Blockchain For Science Con": *https://youtu.be/Rz-IG-xXm5c*
- Nakamoto (2008): Bitcoin: A Peer-to-Peer Electronic Cash System: *https://bitcoin.org/bitcoin.pdf*

6. 2. Solution space

CHEER UP! - An app for people with mental health issues

Team, authors: Zhoulei Peng (The University of Edinburgh), Vasu Kapoor (KU Leuven), Clara Cantos Delgado (Universidad Complutense de Madrid), Kia Kalvas (Helsingin Yliopisto)

Facilitators: Prof. Covadonga de la Iglesia Villasol (Universidad Complutense de Madrid), Agnès GARCIA (Université Paris 1 Panthéon-Sorbonne)

In 2017, seven hundred and ninety-two million people suffered from mental disorders but only 3% attended therapy. This is because, therapy is unaffordable for most people since it can amount to more than a sixth of their salary. And secondly, because, as reported by this US survey, most people don't take mental health seriously.

This is where we come in. We designed an app CHEER UP! that connects people with similar mental health issues to normalize their problems, identify potential symptoms and provide support. Users start by creating an account that includes their personal details.

Users take the self-assessment test to get some information that will determine the content to which they will have access to in the app. Every three months they can retake it and update their profile.

After getting the results of the self-assessment test, users get access to relevant videos and articles previously filtered by our team of psychologists which explain the science behind different problems. Through them, users are also encouraged to engage in exercises which can help them tackle the problem they are facing.

Every weekend, our team of psychologists hosts group therapy sessions regarding a particular mental health issue. Ten random users will be invited to speak in a supervised session while the rest can still attend as audience and learn from other people's experiences. If users wish to, they can arrange a one on one session with one of our psychologists for a relatively nominal price.

To continue the normalization process, CHEER UP! allows its users to share their own stories of how they are tackling their issues as posts in a feed. These posts are sorted according to their hashtags and the number of upvotes they receive. The posts which receive the most upvotes will stay at the top of the feed. Users will only be shown posts related to their psychological issue and they can see the profiles of other users and connect with them. If posts are found to be inappropriate, users can report them, after which our team will decide whether to remove them or not.

Already existing contacts will be shown on this screen. Just like in messaging apps, users can text, video call and create groups with other people.

Using this button, our users can start new chats.

To promote motivation, users can organise their days, keep a to-do list and channelize their thoughts through a personal journal.

If they need immediate help, for example, if suffering from an anxiety attack, they can find the number for local helplines in our app.

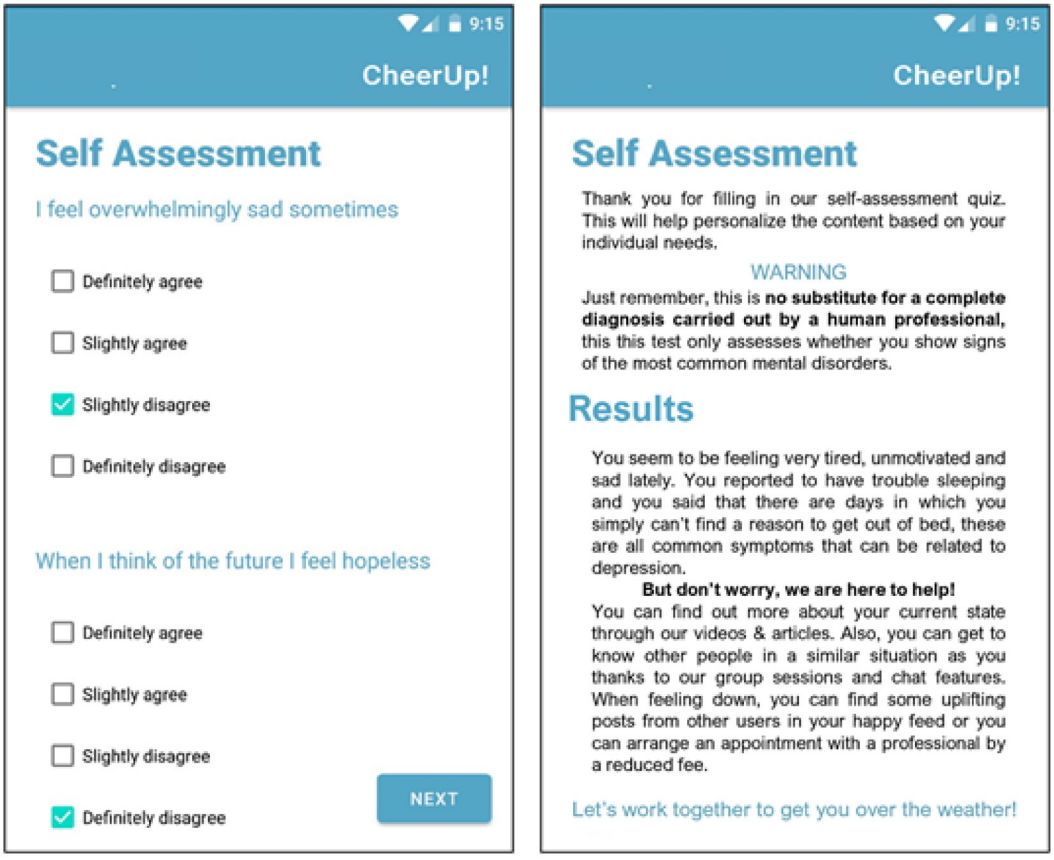

Figure 6. Infodemic prototype screenshots

Uni MEET – connecting students

- **Team:** Marjolein Delaere (Università di Bologna), Lee Kaiyan (The University of Edinburgh), Alena Konina (Helsingin Yliopisto), Jenni Sippala (Helsingin Yliopisto), Pedro Miguel Bernardino Sousa (KU Leuven)
- **Facilitator:** Nicolò Cocchi (Università di Bologna)
- **Author:** Nicolo Cocchi (Universita di Bologna)

During the UNA.FUTURA Design Sprint, we tackled the issue of loneliness in academia by prototyping a change-oriented solution. Research shows that 1 out of 5 university students suffers from a mental health issue (with depression and anxiety topping the list), and that 1 out of 3 university students either experiences an issue for which they felt the need for professional help, or feels lonely (UK University Student Mental Health Survey, 2018). To tackle the isolation problem, we developed an application, called “Uni MEET”, which aims to connect students, wherever they are. The application is composed of 3 main features - Meet & Connect, Events, and Study Groups - and is available at the following link: *https://www.figma.com/file/uUpJJmnEd8wYPust7y5NMi/Uni-Meet?node-id=0%3A1*.

We firmly believe that connecting to others, especially to people with similar experiences, can help alleviate the burden we are all carrying. Therefore, we invite universities all around the world to consider our solution concept for further developments.

HEI network platform for students with mental health issues

- **Team:** Virginia Pupi (Università di Bologna), Anna Gadignani (Università di Bologna), Aino-Elina Kuusimäki Helsingin YliopistoSimar Mann (The University of Edinburgh), Betty Mwema (The University of Edinburgh)
- **Facilitator:** Jake Watts (The University of Edinburgh)
- **Author:** Jake Watts (The University of Edinburgh)

Our group’s initial discussions explored the dearth of coordinated online structural provision of mental health resources within and across higher education institutions.

Our discussions initially mapped the imbalances between institutions across the Una Europa network, and latterly the Erasmus+ consortium. Institutions within these networks vary in their approaches to financing provision and raising visibility of said services and the cultural and linguistic

heterogeneity and specialist nature of these resources can create numerous issues for students with regard to knowing what support is available, where it is available, and how to access it.

We discerned that the lack of a centralised effort to collate, create and signpost resources and services poses an initial barrier to accessing much needed support and knowledge about resources for those seeking assistance.

Our solution simply proposes to utilise the already established and existing accords and organisational links between and across HEIs within our network to provide a web-based infrastructure that would be an initial point of access for students needing to survey the array of resources available to them.

This Una Europa framework would provide a scaffold onto which an initial index would signpost students to relevant support and resources within the network through an interactive map interface. More uniquely it would also include a peer-sourced interface that would allow students who are residents of host cities within the network to map useful local sites and forms of knowledge that can be accessed by peers to provide useful and bespoke resources aimed to help students preserve their mental health.

Our hope in consolidating and mapping these forms of information would be to enhance opportunities for students to establish and maintain social relations and their mental well-being wherever they study.

Conceptual metaphors to improve crisis management

- **Team:** Dominika Lis (Uniwersytet Jagielloński w Krakowie), Rycahel Eric Andriana (Université Paris 1 Panthéon-Sorbonne), Suvi Lehtosalo (The University of Edinburgh)
- **Facilitator:** dr Marta Silvera-Roig (Universidad Complutense de Madrid)
- **Author:** dr Marta Silvera-Roig (Universidad Complutense de Madrid)

By identifying metaphorical linguistic expression from different European languages, we accessed the conceptual metaphors guiding meaning within the context of the global Covid crisis.

The metaphorical linguistic expressions and conceptual metaphors used in digital media to refer to the pandemic reflect its impact on our mental health. We claim that we should not censor the use of metaphors - as has been proposed - such as the ILLNESS IS WAR conceptual metaphor because of

the mistaken belief that they negatively affect our perception of a health crisis.

On the contrary, the description of the use that we make of language as a community can help health and communication professionals to have a broader vision of a health problem. As a society we can all benefit from getting to the real problem behind linguistic expressions rather than staying on the surface and just changing the way we express ourselves.

Cognition is pre-linguistic, so metaphorical linguistic expressions should, instead, serve as an indicator of attitudes and emotional states. Thus, we have identified several conceptual metaphors which serve as an access point to the conceptual map of construction of meaning in the pandemic context.

Closing remarks

Una Futura was a joint effort of people of diverse standing from Una Europa universities – students, doctoral students, academics, facilitators, members of organizing committee, and also experts from other universities and organizations. The success of Una Futura is the active participation of these people, clustered around the spirit of the community of Una Europa.

The proposed solution concepts to the digital challenges show that this kind of joint effort may contribute to shaping preferable scenarios of the near future. The concepts presented are certainly worth further development. Some teams are on it, but the open innovation format of this project allows everybody to build on the concepts provided, or simply use them as inspiration. On the top of that, the concepts offer an interesting perspective on the expectations the society has from policymaking, public administration and enterprises. From this point of view, the results might enhance public debate on digitalization and social needs.

The content of this book and the experiences of participants, expressed for example in this podcast "Reflections on Una.Futura - Podcast #6 on student innovation"[9], indicate that the goals of the project have been accomplished. But Una Futura was just a small step exploring how University of the Future may look like, and what impact it might have.

9 https://www.una-europa.eu/stories/reflections-on-una-futura-podcast-6

JAGIELLONIAN UNIVERSITY IN KRAKÓW

POLISH NATIONAL AGENCY FOR ACADEMIC EXCHANGE

RESEARCH UNIVERSITY EXCELLENCE INITIATIVE

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