2ⁿᵈ Navigating Knowledge Landscapes' International Conference

Health and Bioethics in the Digital Society

Zagreb, December 6ᵗʰ, 2018

The new conditions posed by the digital society include the on-line overload of information, complex multi-directed communications, and extreme social potency. In addition, the accumulation and distribution of knowledge, by experts and lay people, are interwoven with economic relations, legal and administrative regulations. How the emerging digital society would relate to the health and bioethics represents one of the major challenges to be addressed at this conference.

Location: Large Hall "Velika vijećnica", University of Zagreb Main Building, Trg Republike Hrvatske 14, Zagreb, Croatia

The organizers:

Navigating Knowledge Landscapes Network,

http://knowledge-landscapes.hiim.hr/

Centre of Excellence for Integrative Bioethics,

http://www.bioetika.hr/eng/

Centre of Excellence in Basic, Clinical, and Translational Neuroscience

http://zci.hiim.hr/index.php/en-us/

University of Zagreb

http://www.unizg.hr/homepage/

University of Zagreb School of Medicine, Croatian Institute for Brain Research

http://mef.unizg.hr/en/

Local Organizing Committee:
Srećko Gajović, Hrvoje Jurić, and Denis Kos

Administrative support:
Olja Ulični Nikšić

Final Program

8:30 – 9:00   Registration

9:00 – 9:05   Welcome and opening of the Conference

9:05 – 11:00   *Oral presentations*

        9:05-9:25   **Anna Lydia Svalastog** (Østfold University College, Fredrikstad, Norway)**:**
        Health in the digital society: The juxtaposition of knowledge and culture

        9:25-9:40   **Srećko Gajović** (University of Zagreb School of Medicine, Zagreb, Croatia)**:**
        Knowledge Landscapes in shaping of the personal health narratives

        9:40-10:00   **Hrvoje Jurić** (University of Zagreb Faculty of Humanities and Social Sciences, Zagreb, Croatia)**:**
        Life and Health between Data, Information and Knowledge

        10:00-10:20   **Lucia Martinelli** (MUSE – Science museum, Trento, Italy)**:**
        Stories of common people on their everyday genetics

        10:20-10:40   **Dubravka Švob-Štrac** (Institute Rudjer Boskovic, Zagreb, Croatia)**:**
        Neuroenhancement for increasing demands of digital society

        10:40-11:00   **Luka Janeš** (University of Zagreb Faculty of Humanities and Social Sciences, Zagreb, Croatia):
        Bioethical Issues of Internet Mental Health Treatment

11:00- 11:30   Coffee break

11:30 – 13:30   *Oral presentations*

        11:30-11:50   **Jana Šimenc** (Scientific research center of Slovenian Academy of Sciences and Arts, Ljubljana, Slovenia):
        Facebook as a co-creator of illness experiences of persons with rare/atypical diseases

        11:50-12:10   **Tea Vukušić Rukavina** (University of Zagreb School of Medicine, Zagreb, Croatia):
        Dangers and benefits of social networks: E-Professionalism of healthcare professionals

        12:10-12:30   **Siv-Britt Björktomta and Heidi Aarum Hansen** (Uppsala University, Uppsala, Sweden, and Østfold University College, Fredrikstad, Norway):
        Social Services in the Knowledge landscape – How children´s navigating are challenging social work´s practices

12:30-12:50   **Denis Kos and Marko Kos** (University of Zagreb Faculty of Humanities and Social Sciences, Zagreb, Croatia):
Orientation in the digital society at the crossroads of health, bioethics and literacy

12:50-13:10   **Stjepan Orešković** (University of Zagreb School of Medicine, Zagreb, Croatia):
Digital Divide in HealthCare: Big Industry's Hype or Non-Fictional HealthCare Calamity?

13:10-13:30   **Predrag Pale** (University of Zagreb Faculty of Electrical Engineering and Computing, Zagreb, Croatia):
Navigating Knowledge Landscapes – Two Faces of the Truth

13:30 – 15:00   Lunch

15:00 – 16:00   Discussion groups -
- *The digital society - Altered conditions for health*
- *The bioethical challenges of digital society*
- *The plurality of cultures vs. the plurality of technologies*

16:00 – 17:00 Special lecture, reports of discussion groups and joint discussion

16:00-16:20   **Christian Fritz-Hoffmann** (Bielefeld University, Faculty of Sociology, Bielefeld, Germany):
Between the development of technology and the use of technology – new ways of interdisciplinary cooperation?

16:20-16:50   *Reports of the Discussions groups (10 min each)*

16:50-17:00   *Joint discussion*

17:00 – 17:30 *Promotion of CMJ anthology on Knowledge Landscapes – collection of papers published in Croatian Medical Journal on the topic of the knowledge landscapes*
Editor-in-Chief Croatian Medical Journal, **Dr. Anton Glasnović**

17:30   Wrap up and closing of the Conference

19:00   Conference dinner, location TBD, participants pay for themselves

Note: The Conference is open to registered participants. There is no registration fee. To register follow the instructions given later in this announcement.

Zagreb NKL-Network Meeting

Zagreb, December 7th, 2018

The meeting is dedicated to the NKL-Network members only. For information about the NKL-Network and list of members visit:
http://knowledge-landscapes.hiim.hr/
To apply to be member of the NKL-Network send an email to Anna Lydia Svalastog:
anna.l.svalastog@hiof.no

Location: Croatian Institute for Brain Research (Seminar Room at the First Floor)
University of Zagreb School of Medicine, Šalata 12, Zagreb, Croatia

Preliminary Program

9:00   Welcome and opening of the NKL-Network Meeting

11:00   Coffee break
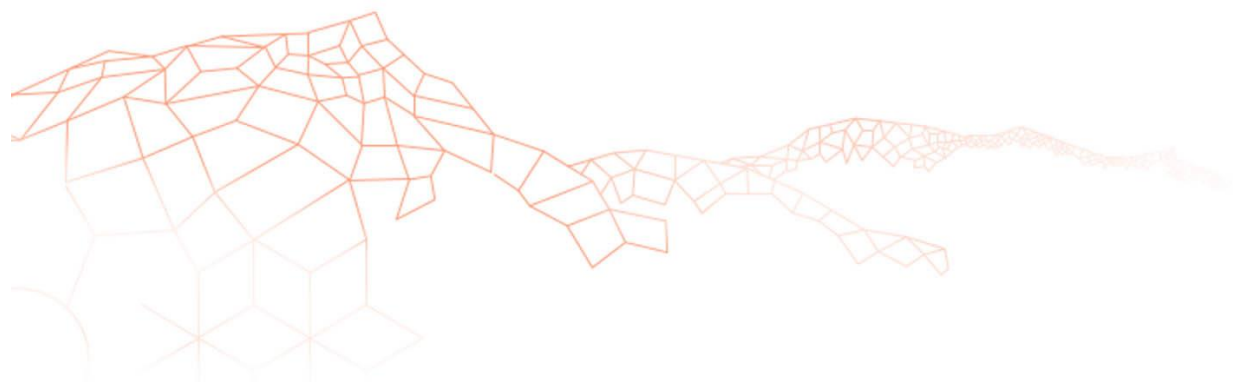13:00   Lunch

Managing Network, new members, new non-academic members

Network joint activities   – research
                                   – grant applications
                                   – publications
                                   – meetings

14:00   End of the NKL-Network meeting

ABSTRACTS

Health in the digital society. The juxtaposition of knowledge and culture

Anna Lydia Svalastog

Østfold University College, Dpt. of Health and Wellfare, Fredrikstad, Norway

In less than 15 years the use and way we move on the World Wide Web has changed. Starting out as a way to share information through home pages, Web 1.0 was rapidly exchanged with the Web 2.0 and its social media platforms. Social interaction, co-production and sharing across platforms and devices became characteristics. Today we have moved into an area with Web 3.0 software, machine to machine communication where different digital devices register data to support and monitor for example person's blood sugar. The potency of the new technology is widely recognized. WHO, UN, EU, international as well as national levels, have all pointed towards digital solutions, services, tools and therapies (e-health, Behe@lthy, m-helath), to be introduced by individuals and society. From the angle of governmental bodies, the implementation of the suggested strategies seems to be understood as primarily a question of health literacy. Still, how a person read and understand information in the on-line environment is a complex process. Navigation for on-line information is a process where the one navigating becomes an active co-producer of meaning and knowledge. The process of co-production is complex, it is a product of algorithms, personal preferences, and how contexts bring meaning and thus shape interpretation of the information that is found. The process of navigation is a process of inclusion and exclusion of digital information and on-line networks. Taken together navigation towards health knowledge is not merely a question of literacy, but a question of complex conditions, technologies, social and cultural contexts, and digital multiculturalism.

Knowledge Landscapes in shaping of the personal health narratives

Srećko Gajović

University of Zagreb School of Medicine, Croatian Institute for Brain Research, Zagreb, Croatia

The digital technologies opened for human activities the new frontiers into the virtual realm. This modifies the way individuals behave, interact and percieve their lives, and it includes as well their health.

We have described the digital environment opened for human use as landscapes. In relation to health, as the individuals look for answers or solutions about their health issues, we have argued that the knowledge being there is shaped as well in the form of knowledge landscapes. These landscapes turn to be rather complex, flexible, tentative and both stable and ever changing.

The relationship between health and disease is certainly not binary and both states can exist independently from each other. Therefore, I argue that the personal narrative in relation to the health, i.e. health narrative is crucial for the individual health status. These narratives are

extended frequently in the digital sphere, and tend to shape the activities in the knowledge landscapes. As the current users are prosumers, i.e. producers and consumers, the individual health narratives as well shape the content of the knowledge landscapes.

In the same way, as the prosumers influence knowledge landscapes, there is an immanent ability of knowledge landscapes to shape the individual health narratives. As the narratives unite knowledge and the context, I argue that they are among most powerful features of knowledge landscapes in relation to the health.

Life and Health between Data, Information and Knowledge

Hrvoje Jurić

Faculty of Humanities and Social Sciences, University of Zagreb

In this paper, the author tries to establish a conceptual framework for discussion on health and bioethics in the digital society by defining very notions of health and life, on one hand, and data, information and knowledge, on the other hand. The author also focuses on the relationship between knowledge and morality, which is of crucial importance for articulating, discussing and solving the problems in both digital ethics and bioethics.

Stories of "common people" on their "everyday genetics"

Lucia Martinelli and Patrizia Famà

MUSE – Science museum, Trento, Italy,

How much do we know, how much would we like to know and how much do we fear to know about the causes of our physical and psychological traits -whether we like them or not- and about talents and diseases recurring in our families? Is it a question of a "destiny" marked by inherited genetic predispositions, or do personal options, responsibilities and experiences can shape us? Our DNA contains predispositions to behaviors, talents and diseases, which may become manifest over the life course, or may not. The growing knowledge about human genome has already been applied in several fields, including healthcare. Markers for genes involved in important diseases are available to anticipate the awareness of predispositions as science is continuously updating the spectrum of knowledge about genome. Information on our genome is easily available, as for instance in genetic tests offered at accessible prices on numerous websites. Particularly regarding health, the increasing possibility of this knowledge offers advantages but also choices that can be difficult.

In the 2018 main temporary exhibition 'The Human Genome. What makes us unique' we curated at MUSE, the Science museum of Trento, Italy, a core section regards genetic predispositions. We

aim at stimulating reflections about crucial questions arising from genomics applications, rather than presenting notions to passively fed visitors. In a space representing a square, we brought together the knowledge and experiences of the main actors of the biomedical development of our society: the lay citizens, the scientific community, the medical care professionals, the policy makers. On the edge of the square, video-interviews to experts report on clinical experience and healthcare policies to envisage solutions for treatments and prevention, whilst in the center of the square, six silhouettes representing the citizens give voice to the "ordinary people" so that their experiences can enhance museum visitors' understanding of the personal impact of the new genomic knowledge.

Their stories are inspired by cases proposed in the scientific literature, news reported in the media and real stories shared through Internet or available on the websites of medical organizations and patients. Besides the narratives of Daniele, a synesthete, and Nicolò, who has the Marfan syndrome, visitors can know the stories of: Alice, a 15-year-old homozygous twin sister, who tells about sharing the same genes with another person; Ammy, who reflects on the various scientific hypotheses to explain the extraordinary athletic performances of the Jamaican teams; Jomo, who analyses how a behavioral disorder, as the Attention Deficit Hyperactivity Disorder (ADHD), may have different outcomes in different environments. Finally, the difficult choice to know about the chance to carry -or not- a hereditary genetic mutation, such as BRCA, is told in the confidence of Angela, a young woman and future mother, about to face a test that requires responsibility for herself and for the child she is waiting for.

At exit of 'The Square', in an intimate room, as visitors of the exhibition are invited to leave their own stories about genetic predispositions, we have collected a number of significant stories of their "everyday genetics".

Neuroenhancement for increasing demands of digital society

Dubravka Švob-Štrac

Institute Rudjer Boskovic, Zagreb, Croatia

Abstract to be added later.

Bioethical Issues of Internet Mental Health Treatment

Luka Janeš

University Centre for Integrative Bioethics, University of Zagreb

Contemporary technological era is marked by an unlimited and unmeasurable wideness of information that is available online. The given procurability is a double-edged sword. One edge provides comfort and ease of searching for useful information which can help us in finding proper solutions for certain life situations, and the other one is a "simulacrum" of information, hyperinflation which takes us to the "wall" of relative truth. The relativity is especially present in the context of mental health issues, in searching for simple and effective methods of helping us with improving our mental health status in the form of online self-help. Besides the high financial costs of buying fake information, in the context of bioethical reflection, the biggest problem is the fact that persons with mental health problems are in most cases desperate and they are willing to believe in plenty of false advice without critical rethinking the trueness of claims. They are passively absorbing the given data. In this presentation, I will consider the given situation in the methodological and subject key of integrative bioethics, exploring the problems of the legality and legitimacy of inputting unverified mental health orientation data on the internet, easily accessible and widely spread across thousands of e-portals. Also, I will criticize the lack of legal regulation of mental health and self-help data available online.

Facebook as a co-creator of illness experiences of persons with rare/atypical diseases

Jana Šimenc

Sociomedical institute, Scientific research center of Slovenian Academy of Sciences and Arts, Ljubljana, Slovenia

The closeness of the digital and heath seeking behavior has never been more intense than today. For the last 15 years a growing body of literature encourages debates about the "expert patients" (Fox et al, 2005) and/or patient empowerment (Garbin 2008; Piper, 2010; Oprešnik 2017). And since the emergence of social media (in 2004), many researchers focused their attention to effects of emerging utilization of social media among patients (for review of research, see Samilhodzic et al 2016). On the other hand, critical studies offer insights into the hidden power structures behind the social media. In the context of neoliberal orientation, (predominantly) dystopian academic literature is putting at the spotlight discussions about the politics of governance, surveillance, commercialization, exploitation (e.g. of personal data, Lupton, 2016; free labor, Teranova 2000; Fucks 2010; Till 2014; Brown 2014).

The aim of the presentation is to move beyond the above mentioned discourses and to give a fresh perspective over understanding of the relational and ontological complexity of contemporary illness experience in a chosen (Slovenian) post-socialist environment. Drawing on ethnography conducted in Slovenia in the context of postdoctoral research project "Health in the pocket and

on the internet" (financed by the Slovenian research agency) from January 2016 till December 2017, I will explore the temporality and relationally of persons' navigation on Facebook during the process of seeking the way out of the (biomedically unexplained) pain and poor treatment of rare disease. My research indicates, that persons with rare diseases or medically unexplained chronic health difficulties/condition that are experiencing systemic neglection, unrecognition, long suffering, pain and "multiple layers of invisibility« (see Phillips, Rees, 2017) became more active and engaged in seeking solutions towards the cure and better health. What is more, due to the extremely low incidence of certain disease, persons with rare diseases living in countries with small population (like e.g. Slovenia with 2 million inhabitants) struggle even harder with obtaining the proper diagnosis. Among the everyday modalities of health seeking behavior, Facebook appears as a channel for communication, support, awareness raising activities, activism and bottom up medicalization. For the analysis I will focus on the narrative and longer observations of the patient struggling with getting the accurate medical diagnoses and treatment. The analysis of the case will open up a window towards better understanding of the process behind becoming an expert/empowered patient, and the dynamics between lay and professional knowledge or put otherwise, how "traditional" hierarchical/authoritative knowledge structures are being challenged during the experiencing of rare disease. Creativity of users/patients mediated through the Facebook during the process of illness experience will be emphasized.

DANGERS AND BENEFITS OF SOCIAL NETWORKS: E-PROFESSIONALISM OF HEALTHCARE PROFESSIONALS

T VUKUŠIĆ RUKAVINA[1], J VISKIĆ[2], D RELIĆ[1], M MARELIĆ[1], D JOKIĆ[3], K SEDAK[4]

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Introduction: Social networks are defined as web sites and applications that allow users to create, share, comment on content and present platforms that enable social networking. With the emergence of digital media and social networks, the term e-professionalism of healthcare professionals is defined as attitudes and behaviors that reflect the traditional paradigms of professionalism of health professionals manifested through digital media. Numerous studies suggest that it is necessary to explore the role of social media in educating healthcare professionals, social networks can be one of the ways of personal and professional development and tools in the process of lifelong learning. Students belong to the generation of millennials who are more comfortable in using social networks than their teachers. Students are confused about the ethical, legal and professional implications of their behavior on social networks, their concept of e-professionalism is unclear, and the difference between professional and unprofessional use of social networks and the need to provide curricula to acquire the skills necessary to use social networks, especially from the aspect of e-professionalism.

Methods: Aim of this presentation is to explore the impact of social networks on e-professionalism of future healthcare professionals in the Republic of Croatia. Research topic was focused on the e-professionalism of students of School of Medicine and School of Dental Medicine, University of Zagreb. The frequency of using social networks was researched, the most commonly used social networks were identified and differences in the attitudes and experiences among students.

Results and discussion: Digital media influence a wide range of medical professional behavior, and present both dangers and challenges to opportunities. The opportunities are: 1) the use of social networks as a tool to improve information sharing; 2) the process of life-long learning is supported by social networks; 3) mentoring student activities on social networks. The most common limitations are insufficient reliability, questionable quality of information, lack of privacy and confidentiality, inadequate use of social networks for communicating with patients and social networks may be an obstacle to realizing "real" contact with a healthcare worker.

Research support: This research was funded by Croatian Science Foundation Installation Research Project (UIP-2017-05-2140) "Dangers and benefits of social networks: E-Professionalism of healthcare professionals". The authors declare that there is no conflict of interest.

Social Services in the Knowledge landscape – How children´s navigating are challenging social work´s practices

Siv-Britt Björktomta, CESAR, Centre for Social Work, Uppsala University

Heidi Aarum Hansen, Østfold University College

One of the most important responsibilities for social child welfare services is to protect children against harm, i.e. different forms of abuse. In this context, knowledge of how children's use and navigate social media, is important in terms of fulfilling the services obligation to society. In this paper we discuss children's use of social media in relation to investigatory work concerning children and families in Norway.

We focus on the fact that children today are navigating and using social media. Children today have grown up with social media, even young children use social media as a way to communicate with others. Concerning investigatory work, we know that email and text messages are used for practical clarification/information purposes, such as making appointments and exchanges of practical information. On the other hand, there is hardly any indication that professionals are using social media as a source of information, or as a tool to build relations in the context of their investigatory work.

This paper is based on a qualitative study. We conducted three focus group interviews with Norwegian social workers, employed in the municipal Child Welfare Service. The aim of the study was to explore how social workers are using social media in investigatory work. In addition, the study explored challenges linked to the use of social media. The data was analysed using a thematic analysis, and was informed theoretically by a social constructionist and narrative approach.

The analysis suggest that social workers approach children and families through digital technologies, although in different ways. In this knowledge landscape four different areas have been visible that social workers are struggling with. The areas are not separate parts, furthermore, they are intertwined at the same time they are interacting with each other.

The first area is about the professional approaches, i.e. how to use the digital technologies and how to communicate with children and families. Secondly, there is the legislation, i.e. to strike the balance between information and secrecy. Thirdly, there is the ethical perspective, i.e. children's need of protections, provisions and participation. Finally, there is the organizational perspective, i.e. meeting children on social media means that social workers, among other things, have to be available through the major part of the day compared to current framework factors.

Orientation in the digital society at the crossroads of health, bioethics and literacy

Denis Kos[1,2], Marko Kos[2,3]

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[2]Centre of excellence for integrative bioethics, University of Zagreb

[3]University of Zagreb, Faculty of humanities and social sciences, Department of philosophy

This presentation starts by looking at integrative bioethics as an integrative orientative science which stems from the critique of the techno-scientific axis of societal development. It will make connections between concepts in bioethics and information sciences which share the goal of finding and providing means for orientation in the digital society related to contemporary health-related bioethical issues. In the second part, the presentation focuses on educational solutions stemming from the discourse about information and data literacy. Here we debate both the framing of content as well as the pedagogies necessary in order to shed light on information and data-related practices which should be promoted to face the challenges of providing health in the digital society.

Digital Divide in HealthCare: Big Industry's Hype or Non-Fictional HealthCare Calamity?

Stjepan Oreskovic

Center for Research and Promotion of Best Practice in Healthcare University of Zagreb School of Medicine

The newest and greatest technology available to patients and doctors practicing a "precision medicine" are facing an unexpected barrier, a digital divide between nurses, doctors, hospital systems and consumers, that is growing wider. New technology, in most cases we are discussing a big 5 digital companies, are offering consumers a growing array of health-related applications, programs, monitors, and devices. The big consulting and IT technology industry side story sound clear and simple. By enabling people to own, and control access to, their health data, "*digital/mobile health technologies eliminate the information asymmetry that has long benefited healthcare system incumbents and inhibited the creation of an informed healthcare consumer*". The position of the healthcare digital industry giants and the accompanying big 5 consulting firms is that the consumers can create their own personal health management "ecosystems, quite literally in the palms of their hands, based on individual preferences for how they wish monitor and manage their health and healthcare, as well as how they choose to manage their health benefits and payments". The industry's position is clear and simple: although these technologies currently pose little risk to incumbents, they could create considerable positive disruption in the not-distant future[1]

However, the reality tends to take a different directions. The unusual suspect, an uneducated patient or doctor, is becoming hesitant, reluctant and even grudging while travelling through the new landscape of digital technologies in the healthcare. Patients who have higher health literacy rates are the most skeptical about sharing data because of the lack of cyber security measures, particularly among medical groups, clinics and ancillary facilities according to recent survey results[2]

While trying to explain a relationship between the great developments in digital healthcare industries and patients trust and behavioral attitudes a recent survey "Healthcare's Digital Divide Widens" [3] asked 12,090 consumers to evaluate the technology they were exposed to, know of or interacted. Respondents were especially alarmed that their prescriptions, mental health notes, and chronic conditions were being shared not only with their healthcare provider, but also with retailers, employers, and the government without their knowledge. The research found that 70 percent of patients distrust health technology, indicating a steep climb from 10 percent in 2014. The consequence is that a wide margin of the total population, 89 percent of patients, and the highest rates are among the most educated ones, are withholding health information during visits. The problem is not only on the patients side, a large number of physicians (94 percent) responding to the survey found the amount of data overwhelming, redundant and unlikely to

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[1] McKinsey&Co. How tech-enabled consumers are reordering the healthcare landscape. https://healthcare.mckinsey.com/how-tech-enabled-consumers-are-reordering-healthcare-landscape

[2] Medical ID theft fears makes consumers skeptical of health info tech. http://www.insurancefraud.org/IFNS-detail.htm?key=24542

[3] Black Book Market Research 2017 https://blackbookmarketresearch.newswire.com/news/healthcares-digital-divide-widens-black-book-consumer-survey-18432252

make a clinical difference. Again, among the patients, 93 percent responding expressed concerns over the security of their personal financial information. 69 percent of patients confirm their belief that their current primary care physician does not demonstrate enough technology prowess for them to trust divulging all their personal information. The unwillingness of patients to comprehensively divulge all their medical information rose to 87 percent. Recent data hacking and a perceived lack of privacy protection by healthcare providers played a role in consumer attitude concerning healthcare technology. The consequence is that both physicians and patient adoption of healthcare technology does not represent a certain and simple future, something that should be taken as granted. Our research on use of data sources to develop a predictive models for measles vaccination in Croatia was facing the same patterns towards the use of big data/data science in patients, physicians and institutional behavior.

Navigating Knowledge Landscapes – Two Faces of the Truth

Predrag Pale

University of Zagreb Faculty of Electrical Engineering and Computing, Zagreb, Croatia

Abstract to be added later.

Between the development of technology and the use of technology – new ways of interdisciplinary cooperation?

Christian Fritz-Hoffmann

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Research on the legal, ethical and social aspects of technology development, the so called „ELSI-research", has become a more or less fixed component of current technology development projects. The division into technology development and ELSI- accompanying research suggests that on the one hand there is a field of technology and its development and on the other hand there is a field of society into which technology is then introduced. From this perspective, there are normative, legal or ethical requirements in society, and there are people who will deal with technology or be exposed to its effects, which is why social aspects are also relevant - that is why it is called ELSI. From a sociological perspective, such an understanding of accompanying research appears insufficient.

One of the central insights of sociological technology research is that technology does not exist on the one hand and its normative and social aspects on the other. It is instead necessary to assume socio-technical constellations (cf. Bijker/Law 1992; Rammert 2007). In other words, advanced algorithm-controlled care robots do not differ in principle from handwritten care documentation or a hammer. Whether it is a tangible object or software, technology is always used to replace bodily functions, actions or communications. At the same time it always symbolizes its intended use (target state of use), in which certain expectations of its use are embedded (cf. Lindemann 2014: 184ff). From this perspective, relevant differences between different techniques result only from the socio-technical constellations in which they are developed or applied.

Technological development does not take place in a vacuum from which society and its norms would be excluded. Rather, technology development takes place in a social context. In the local laboratories or in working groups spanning several laboratories, for example, a common understanding of good functioning technology develops that is embedded in the technology ideas of the relevant reference group of an often globally distributed community (e.g. that of the robotics developers). In addition, developers have to reckon with local organisational constraints and, last but not least, with political requirements for financing options - such as the funding lines of the BMBF, the EU, etc. All these aspects affect the concrete processes of technology development and also materially influence the technology to be developed.

If one includes the use of technology, it becomes apparent that a new technology is not simply applied in the way intended by developers. Rather, technology is often applied in a way that was not foreseen by the developers. What practically constitutes a technology does not lie in the technology itself, but is decided in a socio-technical constellation (cf. Bijker 1992; Lindemann 2017). This also means that it is decided in a socio-technical constellation whether the development of a technology is successful or not.

The role of ELSI research has so far been seen in anticipating the need for new technologies in a social practice, identifying acceptance barriers in the population and wihtin the corresponding social fields, and carrying out a technology assessment. The findings of this accompanying

research should then be taken into account both in the introduction of a new technology and in technology development. In this model, sociology, as one of several possible ELSI disciplines, provides advice to technology developers, practitioners and decision-makers.

This model of consultative accompanying research was already criticized in the nineties of the twentieth century (Rose 1998). ELSI research is accused, for example, of merely providing support for controversial research in order to legitimise it, of providing marketing strategies for industry or of being a vicarious agent for funding programmes (Jasanoff 2005, Dickel 2011, Porz 2017, Maring 2015, Togersen 2009). One reason for the conflicting assessments of ELSI research can certainly be seen in the lack of "careful critical reflection on the role of bioethics in institutions" (Porz 2007: p.9): How exactly should cooperations between sociologists, ethicists, practitioners, technicians, etc. look like?

Only a few technology development projects lead beyond prototypes to a measurable effect in the targeted social fields. *What possibilities are there to change such projects in a way that a new technology also effectively solves problems in social practices? How can one develop technologies that are not only constructed with regard to their smooth functionality, but are constructed based on the relevance of a social practice (instead of purely political, economic or technical requirements)? How can technology be developed that is not at the centre of an innovation but supports social and organisational innovations? How can technologies be developed that are open to practical use and re-interpretation by stakeholders? How can technology projects be designed in such a way that the requirements of the engineers are not the forerunner, but project partners from different disciplines and practitioners are equally involved?*

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