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**Health-Privacy Dilemma: is a wearable device the solution?
A case study on the “iFeel-You” wristband**

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1. Introduction

1.1. Context

It's half time in the global fight against the Covid-19 and we are all asking ourselves what actions should be undertaken to avoid another downturn, until a vaccine is found. Wearing masks and social distancing measures are useful tools to combat the pandemic in progress, but they are not socially affordable in a long-term run. The real challenge is to recreate trust in the communities we live in, creating a safe environment that facilitates our social needs and relationships. This means that the invisible virus needs to be turned visible.

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Epidemiologists believe that, among others, the answer relies on tracing¹ and identifying all the potential contacts that an infected person may have had, in order to quarantine and control their ability to further spread the disease². Contact tracing can be done in many ways, either manually by employing hundreds of human tracers via an interview process³ (accepting the additional risk of exposure and costs associated) or by using technological tools and accepting the digital challenge, at the expense of some part of our privacy⁴. Many countries have elected to use different methods for contact tracing activity of those who have tested positive for the virus, in order to determine who else may be infected and then trace the spread down.

Among these, smartphone technology seems to hold the best prospects for digital contact tracing⁵. Penetration and use of these devices are high, making such a solution possible by using location data, GPS or Bluetooth, reversing the movement of an infected person. Covid-19 tracking mobile-apps are being developed all around the world, some can be installed voluntarily, while some have to be installed under the pressure of government enforcement measures. Even high-tech companies, like Google and Apple, have partnered together in order to release a digital contact tracing application for Covid-19 in the next few weeks.

According to the companies, the software will not share your location information with the company or the people who encounter you. Nonetheless, considering how these tech companies have previously used and monetized personal data, more than reasonable concerns have been raised in that regard. The question that arises is whether the penetration of these mobile apps is high enough (60%) to identify those that may have been in proximity of the infected, and whether an acceptable balance between the privacy of individuals and the safety of society can in fact be achieved⁶.

1.2. Smart bracelets

This article wants to emphasize the role of another technological tool, currently being developed and used in order to prevent the spread of the pandemic: smart bracelets. Could these wearable technologies be more effective, privacy friendly and non-discriminatory than mobile-apps in the global fight against Covid-19?

These tools would be an option to increase coverage and tracking of the infected, having the same basic digital contact tracing functionality of a smartphone, while being at the same time a cheaper device with minor privacy concerns. They could be used by people who do not own a smartphone nor possess digital skills (digital inability), generally the oldest part of the population,

¹ L. Ferretti, C. Wymant, M. Kendall, L. Zhao, A. Nurtay, L. Abeler-Dörner, M. Parker, D. Bonsall, C. Fraser, "Quantifying SARS-CoV-2 transmission suggests epidemic control with digital contact tracing", Science, May 2020, <https://science.sciencemag.org/content/368/6491/eabb6936>.

² A. De La Garza, "What Is Contact Tracing? Here's How It Could Be Used to Help Fight Coronavirus", Time, 22.04.2020, <https://time.com/5825140/what-is-contact-tracing-coronavirus/>.

³ E. Barry, "An Army of Coronavirus Tracers Takes Shape in Massachusetts", NYT, April 2020, <https://www.nytimes.com/2020/04/16/us/coronavirus-massachusetts-contact-tracing.html>.

⁴ S. Ovide, C. Warzel, "A Privacy Absolutist Isn't So Sure Anymore", NYT, April 2020, <https://www.nytimes.com/2020/04/17/technology/coronavirus-location-tracking.html>.

⁵ C. Criddle, L. Kelion, "Coronavirus contact-tracing: World split between two types of app", BBC News, May 2020, <https://www.bbc.com/news/technology-52355028>.

⁶ Y. N. Harari, "The world after coronavirus", Financial Times, March 2020, <https://www.ft.com/content/19d90308-6858-11ea-a3c9-1fe6fedcca75>.

⁷ M. Carlson, L. Cook, "Belgian Port to Test Virus Bracelets Amid Tech Tracing Fears", Claims Journal, April 2020, <https://www.claimsjournal.com/news/international/2020/04/24/296727.htm>.

that seems to be at the same time the most affected by the virus. These bracelets could not only help enforce the public health practice of physical distancing by sending alerts or signals to the user in case of crowded places or close contacts, but also indicate in a very basic way whether a contact has been made and track the relationships. Such a device would prevent people from coming in close contact with each other and prevent further disease transmission.

1.3. Negative Examples

Although these wearable devices could mitigate many risks, several nations are testing or using similar wristbands as a surveillance tool to make sure people are obeying orders to stay at home, while some others, as shown in the following lines, are enforcing a government biometric monitoring activity⁸.

In Hong Kong and South Korea, electronic tracking bracelets are given at the arrival and must be synced to their home location through their smartphone's GPS signal, enforcing quarantine. In Bulgaria, up to 50 residents in Sofia will be given a device that can record their movements using GPS and satellite location data. The trial will use smart wristbands developed in Poland, able to confirm if a person is staying at home, monitoring the wearer's heart rate and call the emergency services⁹. In Lichtenstein, one in 10 residents will be given a band to track temperature, breathing and heart rate, transmitting it to a lab in Switzerland for further investigation¹⁰. Ultimately, India has announced plans to manufacture thousands of location and temperature-monitoring bands for people in quarantine.

This system could drastically stop the spread of the pandemic in a very short time but the downside of it would be the creation of a huge surveillance system, feeding governments data hunger. Central monitoring activities and strong public enforcement aren't the only way to ensure people comply with public health policies. When people are involved and told the scientific facts, enhancing trust in public authorities, citizens will conform and stick together without scrutiny. A self-motivated and well-informed population is usually far more powerful and effective than a policed and ignorant population¹¹.

1.4. Bluetooth strikes back

The question whether people should choose between privacy and health is out of context, misrepresenting the possible solution. People will usually choose health, while a good answer should be to empower both. We do have skills and technology to reach this double goal and many

⁸ S. O'Sullivan, "Big Brother Wristbands that track your every move could be used to relax coronavirus lockdown in UK", The Sun, 2020, <https://www.thesun.co.uk/news/11488096/wristbands-track-every-move-coronavirus-lockdown/>.

⁹ "Quarantined Sofia Residents to Receive Comarch Life Wristbands", Comarch website, April 2020, <https://www.comarch.com/press-center/news/corporate/quarantined-sofia-residents-to-receive-comarch-lifewristbands/>.

¹⁰ S. Jones, "Liechtenstein rolls out radical Covid-19 bracelet programme", Financial Times, April 2020, <https://amp.ft.com/content/06b7e6f3-a725-4eda-9153-e0af48040e30>.

¹¹ Y. N. Harari, "The world after coronavirus", Financial Times, March 2020, <https://www.ft.com/content/19d90308-6858-11ea-a3c9-1fe6fedcca75>.

researchers suggest to use these wearable tools, Ultra-Wideband Bluetooth¹² bracelets, in order to do so¹³. These devices would not require a connection, so there can't be localisation or transfer of any personal data. Additional features such as encryption and deletion of data after 14 days can also be used, tackling privacy fears¹⁴. Furthermore, physical distancing can be implemented using vibration and light flashing warning signals when people come closer to each other, helping to ensure safety protocols.

2. "iFeel-You"

2.1. IIT People: who is Daniele Pucci?

On April 29, 2020, the Italian Institute of Technology ("IIT") published an article divulging their efforts for the design of the prototypical smart bracelet "iFeel-You" that is able to register the wearer's body temperature and enforce his or her social distancing responsibilities. The publication noted that the bracelet's prototype was realized by the IIT's Genovese Dynamic Interaction Control Lab which is coordinated by the researcher Daniele Pucci.

According to the *MIT Technology Review* magazine, Daniele Pucci wants "to rescue the wounded by delivering both food and medicine with his humanoid robots and jet-driven platforms"¹⁵. Notwithstanding his futuristic ambition, the abovementioned journal considers Pucci, Head of the Dynamic Interaction Control Research Line of the IIT since 2019 as one of the leading Innovators Under 35 in Europe.

Dr. Pucci earned his master's degree in Control Engineering with highest honours from Sapienza University in Rome in 2009, after which he received the "Academic Excellence Award" from the same institution. In 2013, he earned the PhD title and whereas four years later, Dr. Pucci became the head of the so-called "Dynamic Interaction Control lab"¹⁶. Broadly speaking the research that is conducted here can be broken down in the research axes of "telexistence", "aerial-humanoid-robotics" and "human-robot-collaboration".

2.2. Moral and scientific responsibility

Last month, the "human-robot-collaboration" axe in particular has profiled itself as a potentially very valuable asset in the second phase of the Italian fight against Covid-19. The *raison d'être* of this axe has, after all, always been to facilitate the development of safe dependable systems that are able to react, perceive and collaborate with human beings. This objective is pursued by

¹² P. Minto, "Bluetooth, come la tecnologia più "goffa" potrebbe salvare il mondo", *Rivista Studio*, May 2020, <https://www.rivistastudio.com/app-tracciamento-covid/>.

¹³ L. Bruggeman, "Researchers investigate whether wearable apps could unveil hidden coronavirus cases", *ABC News*, April 2020, <https://abcnews.go.com/Health/researchers-investigate-wearable-apps-unveil-hidden-coronavirus-cases/story?id=69925541>.

¹⁴ M. Carlson, "Belgian Port to Test Virus Bracelets Amid Tech Tracing Fears", *Washington Post*, April 2020, https://www.washingtonpost.com/gdpr-consent/?next_url=https%3a%2f%2fwww.washingtonpost.com%2fbusiness%2ftechnology%2fbelgian-port-to-test-virus-bracelets-amid-tech-tracing-fears%2f2020%2f04%2f23%2f61aababe-8559-11ea-81a3-9690c9881111_story.html.

¹⁵ M. Blanco, "Daniele Pucci", *MIT Technology Review*, 2019, <https://www.innovatorsunder35.com/the-list/daniele-pucci>.

¹⁶ Istituto Italiano di Tecnologia, <https://www.iit.it/people/daniele-pucci>.

researching along various directions, including research on the control of human-robot interactions, examinations of the online estimation of human musculoskeletal stresses and scrutiny of wearable sensors for force sensing.¹⁷ The latter expounds why the lab had already conducted extensive probing on wearable sensors in the past.

At first sight the wristband “iFeel-You” seems ready to function as the fully-fledged physical equivalent to the mobile application “Immuni”. The app will be used on a voluntary basis, works with anonymized data and is supported by Bluetooth technology. By designating “Immuni” as the official tool to manage phase two of the emergency, the Italian Government hopes to notably speed up tracking coronavirus contagion.¹⁸

In order to dig deeper into this remarkable, somewhat unexpected shift from virtual to physical and the risks and potentiality it brings about, we deemed it important to conduct a case-study and retrieve information firsthand. This is why we organized a Zoom-session with IIT engineer Daniele Pucci, during which different concerns were addressed. The purpose of the interview was to preliminarily assess whether the possible solution to the problem of physical distancing offered by their wristband “iFeel-You”, in particular whether its extensive use would be possible, acceptable and effective to monitoring those people that were excluded from the tracing activity with apps.

Dr. Pucci started off by explaining that, one month ago, he and his colleagues as scientists experienced the moral and scientific responsibility to engage, especially in view of IIT’s high “Technology Readiness Level”.¹⁹ To prevent Italians from complete alienation (Dr. Pucci prefers to talk about “physical distancing” rather than “social distancing”) the coming months, one can and should not just rely on a smartphone to alert people when two persons face a collision risk. This is due to the fact that more than fifteen million Italians may not use the app, mainly due to age or income reasons (*infra*).

2.3. Prototype

For this reason, Dr. Pucci’s team designed a bracelet with two main functionalities. Primarily, the team’s intent was to address the practical concerns raised about the implementation of the social distance measures. The “iFeel-You” wristband supposedly vibrates and alerts the wearer when his or her wristbands approximate another within a certain perimeter, subject also to other parameters such as the duration of the collision. As such, users may rely on their wristband to indicate whether or not subconsciously risks are run. By doing so, the wearable could indeed help the wearer to respect the social distancing rules with a mind set at rest. Secondly, the wearable could facilitate the prompt identification of the disease itself by repeatedly measuring body thermal variations via the wrist of the user. This would allow the wearer to recognize one of the main symptoms of the Covid-19 virus instantaneously.

There is, however, a third feature about which one has not heard the last. When the wearers of two or more bracelets would, for whatever reason, collide with each other, “iFeel-You” is able to memorize the unique identifiers of the bracelets that interacted too closely. This could allow a

¹⁷ Istituto Italiano di Tecnologia, “Human-Robot Collaboration”, <https://www.dic.iit.it/research-axis/human-robot-collaboration>.

¹⁸ Leaders League, “Immuni: Italy’s Coronavirus-tracking App”, April 2020, <https://www.leadersleague.com/en/news/immuni-italy-s-coronavirus-tracking-app>.

¹⁹ For more information: M. Héder, “From NASA to EU: the evolution of the TRL scale in Public Sector Innovation”, The Innovation Journal: The Public Sector Innovation Journal, Volume 22(2), 2017, article 3. (also: https://web.archive.org/web/20171011071816/https://www.innovation.cc/discussion-papers/22_2_3_heder_nasa-to-eu-trl-scale.pdf).

public or private third party to reconstruct the proximities of a person (read: wristband) that might test positive to the Covid-19 infection. This so-called trace-back mechanism has of course given rise to a great deal of debate and much concern. In the chapters to come privacy concerns - that mainly come with the integration of the contact tracing function into wearables - will be addressed.

Dr. Pucci considers that the practical rollout of the prototype does not fall within the Institute's aggregated expertise. He is convinced, nevertheless, that in a first stage "iFeel-you" could serve as a more useful substitute for armbands which are already commonly used at present. One can think about environments such as sport events, resorts, festivals and other contexts in which smartphones are not easily accessible. In a later stage the wearable could be of use for particular population groups or, for example, in specific service lines to support the relaunch of industrial activities.

On a technical note, the bracelet prototype is composed of two parts. Dr. Pucci himself has, however, not yet conceived this as "sufficiently comfortable". In close cooperation with product designers, the Institute now tries to compress the prototype to level up the band's wearability. The used frequency of the radio signal is 2.45 GHz which is, in fact, the same as Bluetooth. IIT developed, however, a proprietary protocol for an easier and faster detection of other proximities which in any case leaves room for when the desirability of complementarity with mobile apps is explored.

3. Potential diffusion of bracelets

3.1 What about...an app?

The key driver that led this case-study was the understanding that the more time was passing by, during this pandemic, the less the proposed app-based solutions for contact tracing were becoming consistent with the objectives set and were finding the sought-for acceptance²⁰. Many concerns have been raised, mostly related to privacy issues, but another aspect was missing in the general discussion, and deserves utmost attention: how many people should download and use the app in order for it to be very effective at significantly reducing the spread of the infection?²¹

Many researchers and epidemiologists, in different countries²², have warned that at least 60% of the population should download it for an efficient and reliable "test, track and trace" strategy. Focusing on the Italian population, the number of mobile smartphones used is around 80.4 million, 133% of the Italian population²³. This number represents only the number of smartphones and could be misrepresenting. The number of mobile internet users via smartphones is around 45.57 million people, i.e. about 75% of the Italian population²⁴.

Upon relying on this important data, the conclusion can be drawn that potentially 1 out of 4 Italian citizens does not possess a smartphone and would be excluded from taking part in the

²⁰ C. Newton, "Why countries keep bowing to Apple and Google's contact tracing app requirements", The Verge, May 2020, <https://www.theverge.com/interface/2020/5/8/21250744/apple-google-contact-tracing-england-germany-exposure-notification-india-privacy>.

²¹ "Show evidence that apps for COVID-19 contact-tracing are secure and effective", Nature, April 2019, <https://www.nature.com/articles/d41586-020-01264-1>.

²² M. Savage, "Only 50% of Britons would download NHS tracing app – poll", The Guardian, May 2020, <https://www.theguardian.com/world/2020/may/10/only-50-of-britons-would-download-nhs-tracing-app-poll>.

²³ D. Parlangei, "L'Italia è il terzo Paese al mondo per numero di telefonini", Wired, January 2018, <https://www.wired.it/internet/web/2018/01/30/digital-2018-dati/>.

²⁴ Report "Digital 2020 Italia", We Are Social, <https://wearesocial.com/it/digital-2020-italia>.

tracing activity. Moreover, considering that the use of this app is on a voluntary basis, it cannot be expected that all the smartphone users would necessarily want to download it. Digging deeper, still in order to guess a possible number of actual contract tracing app users, it cannot be disregarded that the most widely used mobile app in Italy is WhatsApp, which is being currently used by 83% of smartphone possessors²⁵. Considering this percentage as a best-case scenario, the contact tracing apps could be downloaded by at most 37,8 million people, 63% of the Italian population.

Assuming that this actually happens, in the absence of any incentive for promoting the downloading of the app, and with a large part of the Italian population expressing concerns on privacy and use of their personal data, the crucial question which arises, and which is until now left unanswered, is how to monitor those that are not taking part to the tracing activity, probably more than 20 million people, because they lack digital skills, do not possess a smartphone or simply are not willing to download the app.

Looking for alternative solutions to the tracing apps, we noticed the existence of other tools that could free the users from some petty restrictions while helping them to be compliant to many other public health practices, like physical distancing, that are likely to drive companies and citizens crazy. As mentioned before, an interview was organized with Dr. Daniele Pucci, a researcher at the Italian Institute of Technology, in order to gain more information on these alternative tools.

3.2. Disruptive potential

Dr. Pucci particularly stressed that *“one of the main problems to be solved is to create trust”* on the possible technological solutions for contact tracing. We shared these thoughts. He was convinced that it will be difficult for the “tracing” mobile apps to create this trust, not only because of the possible impact on personal data and privacy, but mostly because their software provided activities are technologically based on hardware’s that are meant for a different activity, thus are not fully compliant to the delicate situation and issues involved.

A more transparent answer should rely on *“a technology specifically conceived for this purpose”*. Their bracelet is based on a hardware that doesn’t have any geo-localisation sensor able to monitor the users’ position, so that trust was already thereby ensured because the most invasive risk was excluded. Another requirement strongly held necessary by Dr. Pucci, is the presence of the Institutions that should lead directly to the development and protocols of these tools. Therefore, he suggests the involvement of *“people that don’t have businesses nor commercial activities behind”*. For him, it’s more than obvious that, in order to avoid any possible negative outcome, the states should be involved in designing and processing software and Hardware.

In addition to trust, he pointed to another sticking point, the ability to provide a cheap and intuitive tool. Whilst software and mobile apps are generally downloadable for free, the smartphones are not quite cheap. A reliable product should however be easily accessible for the vast majority of the population. Questioned on the cost of their wearable device, in order for us to understand its economic feasibility, Dr. Pucci answered that no exact cost analysis has yet been made, and pointed *“we started working one month ago, we took the components, the electronic, we put them together and we wrote the algorithm”*. Simple as that. Even though an exact number can’t be given, by adding together the different elements of the wristband *“iFeel-You”*, in order to have an idea of what the price could be, the probable cost would be around 30/40 euros per each.

²⁵ Report “Digital 2020 Italia”, We Are Social, <https://wearesocial.com/it/digital-2020-italia>.

This price could be reduced considerably in case of mass production and cost optimization, as *“it’s not completely crazy to think that this price could be divided by two or even more”*. A possible adoption and implementation of these bracelets could for instance be seen in industrial environments, where entrepreneurs could provide one to the employees that do not possess smartphones or have different Bluetooth versions in their devices²⁶.

This wearable smart-band effectively seems a cheap and effective answer to maintain the prescribed physical distancing and to ensure contact tracing, though this feature and its mass adoption do not appear to firmly be in the mind of its inventor for a possible application in the near future. In our opinion, the “iFeel-You” bracelet could be a viable solution to reliably ensure the tracing of people not using the (tracing) app. As stated by Dr. Pucci, *“my grandmother doesn’t possess any smartphone, but she could wear a bracelet”*. Considering that Italy has the oldest population in Europe (more than 14 million people are over 65 years old²⁷), and that these are at the same time the most affected by the virus, a strong national covid-19 tracking strategy should include them all. Demand boosts for products that consumers know meet certain standards, with the exception of privacy. Proposing solutions that are not effective, expensive or age discriminatory, would not overcome the negative public perception and gain acceptance.

Things are changing really fast. Whilst a short time ago the tracing app looked to be the global solution to the pandemic, now the issues that should be faced are a lot more, and this multiplicity opens up to other technologies. Dr. Pucci and the Italian Institute of Technology have been overwhelmed by press and media coverage, together with some interests raised by private companies and public entities (Regione Liguria). Although no information about the expected number of possible users of the “iFeel-You” bracelet has been communicated to us, the Italian engineer tended to agree to the fact that more than 15 million people could benefit from it, so that for the IIT, as well as for its researchers, the future *“looks promising”*.

4. Privacy, Discrimination... or both?

4.1. Discriminatory effects

As already mentioned in the introductory part, since the outbreak began, several solutions have been evaluated in order to try and stem the spread of Covid-19. Mainly, the general debate is focused on the well-known contact tracing and tracking apps that were considered powerful tools to facilitate the re-opening phase. However, in addition to the perplexities that have inevitably arisen about the scientific validity behind the use of these apps and their actual application - given the fact that some categories of people would likely be excluded for the reasons set out above - there was also a strong debate about the impact on the privacy sphere and the protection of personal data.

Notwithstanding the unleashing of a generalized - and perhaps unmotivated - fear regarding, for instance, the possibility of mass surveillance via GPS tracking²⁸, many worried about privacy

²⁶ K. Leswing, “As workplaces slowly reopen, tech companies smell a new multibillion-dollar opportunity: Helping businesses trace coronavirus”, CNBC, May 2020, <https://www.cnbc.com/2020/05/10/coronavirus-tracing-for-workplaces-could-become-new-tech-opportunity.html>.

²⁷ “Indici demografici e Struttura della popolazione Italia”, Istat, 2019, <https://www.tuttitalia.it/statistiche/indici-demografici-struttura-popolazione/>.

²⁸ D. Dodd, “Contact-tracing apps raise surveillance fears”, Financial Times, April 2020, <https://www.ft.com/content/005ab1a8-1691-4e7b-8e10-0d3d2614a276>

but few seemed concerned about discrimination. In other words, as underlined in the previous chapters, not all age groups are able to use a smartphone - *a fortiori*, not even an app - and this would result in a substantial discrimination based on the digitization rate of people. In this sense, the solution represented by a wearable device would seem to resolve both privacy concerns as well as far more factual concerns related to possible discrimination by age group.

Further to the general prohibition of any discrimination based on any ground²⁹ (including age and disability), the EU Charter of Fundamental Rights contains specific provisions³⁰ in force of which, on one hand, recognizes and respects the rights of the elderly to lead a life of dignity and independence and to participate in social and cultural life and, on the other, protects the rights of children and guarantees the integration of persons with disabilities. Besides, in addition to those categories, there may be other people that for any other reason are unable to use technology (one could almost speak, in this case, of discrimination based on “*digital inability*”). Of course, with particular reference to the case of Italy, discrimination is also prohibited by Article 3 of the Constitution of the Italian Republic³¹.

The impression is that a wearable device could certainly solve the discrimination-related issue described above - since it would be available for all the age groups notwithstanding their digital know-how - and, moreover, it would present less criticality also from the privacy point of view. With reference to the privacy aspects, the policy of iFeel-You is still being processed and much will depend on the actual technical characteristics that will be implemented on it.

4.2. Wearable devices and the GDPR

Considering the material scope of Regulation (EU) 2016/679 (hereinafter also referred to as GDPR), the combined dispositions of Article 2 and Article 4 provide that the Regulation applies to the processing of personal data, wholly or partly by automated means and to the processing other than by automated means of personal data which form part of a filing system or are intended to form part of a filing system and defines ‘personal data’ as any information relating to an identified or identifiable natural person (“data subject”). Therefore, an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name or even an identification number.

Basically, a system that only provides for the receipt of an alert when one wearable device is too close to another, not requiring the wearers’ personal data at the beginning, cannot fall within the scope of the GDPR: indeed, although there is an ID, it would not be technically possible to link it to a name or to a natural person.

In this regard, IIT experts have explicitly stated that, as of date, in the event that only the functions of social distancing and body temperature measurement were implemented, no personal data of the wearers would be collected or stored, nor the IDs of the bracelets in some way registered. Thus, in such a scenario, there are probably no grounds for a material application of Regulation (EU) 2016/679.

Actually, some further clarification is needed when it comes to the measurement of body temperature. In fact, measuring a person’s body temperature is, in principle, a processing of

²⁹ Article 21 of the Charter of Fundamental Rights of the European Union 2012/C 326/02

³⁰ Article 24, Article 25 and Article 26 of the Charter of Fundamental Rights of the European Union 2012/C 326/02

³¹ Articolo 3 della Costituzione italiana, “Tutti i cittadini hanno pari dignità e sono eguali davanti alla legge, senza distinzione di sesso, di razza, di lingua, di religione, di opinioni politiche, di condizioni personali e sociali”.

personal data according to the definitions set out by Article 4 of the GDPR³². “Processing” can refer to many different actions regarding personal data: for instance, viewing, storing, passing on, looking at or deleting personal data. Simply viewing a temperature on a thermometer or with a thermal camera, without the temperature being stored or recorded, is often already a processing of personal data. However, much depends on the context and the way in which this measurement is carried out³³.

Notwithstanding a few exceptions, the GDPR and related privacy rules are usually applied at the workplace, because in most of the cases the data will be (sometimes indirectly) traceable to a specific employee or visitor. However, considering the specific characteristics of a wrist bracelet like iFeel-You, the context becomes completely different.

As a matter of fact, the wearable device is meant to work as follows: the temperature is measured, but completely autonomously and without the intervention of any third party; in addition, the ID of the bracelet, according to what has been declared by its inventors, remains unable to identify the natural person who wears it and / or to be traced back to its name. Even in this case, then, still assuming that no data relating to body temperature is stored, it seems difficult to believe that the GDPR or any other privacy regulation may apply.

A completely different scenario would arise, instead, if the IIT team decided to also add the contact tracing function to the above described features. This would mean that the ID of the bracelets would effectively make the subjects wearing them traceable, therefore identifiable and, consequently, that they would fall within the definition of personal data provided by the aforementioned Article 4 of the GDPR. Clearly, the situation would end up to be very similar to the one already (over)discussed for tracking apps.

Since it is very difficult to make predictions on the actual repercussions in terms of privacy without knowing in detail the technical functioning of the contact tracing system that “iFeel-You” may adopt, the following lines will simply give a summary of the criteria that should be taken into account.

First of all, in this scenario the data controller should provide the data subjects (the wearers) with all the information set out by Article 13 of the GDPR (i.e. identity and contact details of the controller, purposes of the treatment, legal basis, the period of time for which the data will be stored, etc...). It must be stressed that the definition of data controller, joint control and data processors could acquire an even more important role in case the wearable were complementary with other devices or apps.

Obviously, to ensure accountability³⁴, the controller of any contact tracing device should be clearly defined. In any cases, if the deployment of contact tracing apps involves different actors their roles and responsibilities must be clearly established from the outset and be explained to the users. The European Data Protection Board considers that the national health authorities could be the controllers when it comes to applications, but other controllers may also be envisaged³⁵(as for

³² Article 4 (2) of Regulation (EU) 2016/679 “‘processing’ means any operation or set of operations which is performed on personal data or on sets of personal data, whether or not by automated means, such as collection, recording, organisation, structuring, storage, adaptation or alteration, retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available, alignment or combination, restriction, erasure or destruction”.

³³ M. Westhoeve, N. Witt, “Measuring temperature of visitors and employees: is that allowed?”, Lexology, April 2019 <https://www.lexology.com/library/detail.aspx?g=5e26a454-d4f4-47ad-ac46-bbbdf16eacf1>.

³⁴ Article 5.2 of Regulation (EU) 2016/679.

³⁵ “Guidelines on geolocation and other tracking tools, in the context of the emergency linked to Covid-19” issued by the European Data Protection Board on April 22, 2020.

“iFeel-You”, the main option currently being debated sees the bracelets wearer's employer as sole data controller).

In addition to the more general principles such as privacy by design and privacy by default³⁶, which presuppose an innovative conceptual approach as well as the obligation to start a project by immediately foreseeing the tools and the correct settings to protect personal data, the developers of “iFeel-You” should also mind the minimization principle - which, according to Dr. Pucci, has been on the table since the very beginning - and all the other principles set out by Article 5 of the GDPR (namely lawfulness, fairness, transparency, accuracy...).

Referring to the tracking apps, the Italian Data Protection Authority clarified that the processing of personal data complies with the aforementioned principles insofar as it provides only for the collection of data relating to the proximity between devices, their treatment in pseudonymous form - on condition that they cannot be completely anonymized - excluding the use of geo-location data and limiting their conservation to the time strictly necessary for the pursuit of the indicated purpose, with automatic cancellation at the expiry of the term³⁷.

In the expectations of further guidelines, it is plausible to believe that compliance with similar criteria can constrain not only tracking apps, but also any hardware that performs the same function - and, therefore, such criteria could be applied to “iFeel-You”.

5. Conclusion

The purpose of this article is to convey the following points of reflection.

Firstly, protective masks and physical distancing measures are necessary tools to combat the pandemic in progress, but they are not socially affordable in a long-term run. A normalized decreased sense of trust, safety and security imposes a burden upon people that could turn out to outweigh the conceivability of contamination. Regaining trust in the communities we live in, creating a safe environment that facilitates our social demands and relationships is deemed essential whilst learning how to live with Covid-19 eventually³⁸. Becoming aware of the difference between physical and social distancing can help us improve our mental health during these unprecedented times.

Secondly, we became convinced that it will be difficult for mobile apps alone to create this trust, not only because of the possible impact on personal data and privacy, but also because their software provided activities are technologically based on hardware's that are meant for a different activity, thus are not fully compliant to the delicate situation and issues involved. Moreover, many categories of persons are not (yet) able to use a smartphone, which seems to be at odds with some fundamental rights, potentially giving rise to discriminatory disease prevention based on age, income or digitization rate of people. Sometimes the best solution is the one that quickly identifies other people's needs, siding with them together and strategizing efficiently on how it could become, fast and cheap, a mutually beneficial solution. In this sense, the solution represented by a wearable device would seem to resolve both privacy concerns as well as far more factual concerns related to possible discrimination of certain population groups. Smart wearables would prevent

³⁶ Article 25 of Regulation (EU) 2016/679.

³⁷ Parere sulla proposta normativa per la previsione di una applicazione volta al tracciamento dei contagi da COVID-19, April 2020.

³⁸ D. Nabarro, “We must learn to live with Covid-19”, BBC, April 2020, <https://www.bbc.com/news/av/health-52369969/who-s-nabarro-we-must-learn-to-live-with-covid-19>.

people from coming in close contact with each other and could technically prevent a further spread of the disease.

Thirdly, the importance of a transparent regulatory framework should not be underestimated. A pragmatic, preferably cross-boundary, approach is inevitable in order to allow entrepreneurs, scientists and think-tanks to initiate new, performing solutions. Ad hoc legislation is required to ensure maximum clarity and transparency regarding the collection, storage and duration of treatments, with the purpose of delivering to the community solutions that are effective and yet non-discriminatory and privacy-compliant.

Lastly, as much as we should not be forced to choose between national loyalty and global solidarity, we should not even need to choose between health and privacy - instead we need to pursue both of them. Although in times of crisis such as the present one, governments around the world are called to make quick decisions that may conflict with the sphere of individual rights. Still, the *privacy VS health* dichotomy appears to be a misleading one, as there should not be any collision between keeping our health data safe and private while being provided with the best healthcare. We need to use the most innovative and accessible technological tools in order to stop the epidemics and allow the economic processes to restart, considering with the necessary seriousness all the possible solutions, but these tools must be used carefully and wisely.

ABSTRACT: *While the battle against the health and economic crisis caused by Covid-19 is raging, the debate about tracking apps and concerns about their use seems to have not yet found a turning point. Many are concerned with the sphere of individual rights, some see a dichotomy between privacy and health, but few have considered the possible implication of age and social discrimination. Perhaps, there are alternative and complementary solutions that could help resolve some of these issues.*

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