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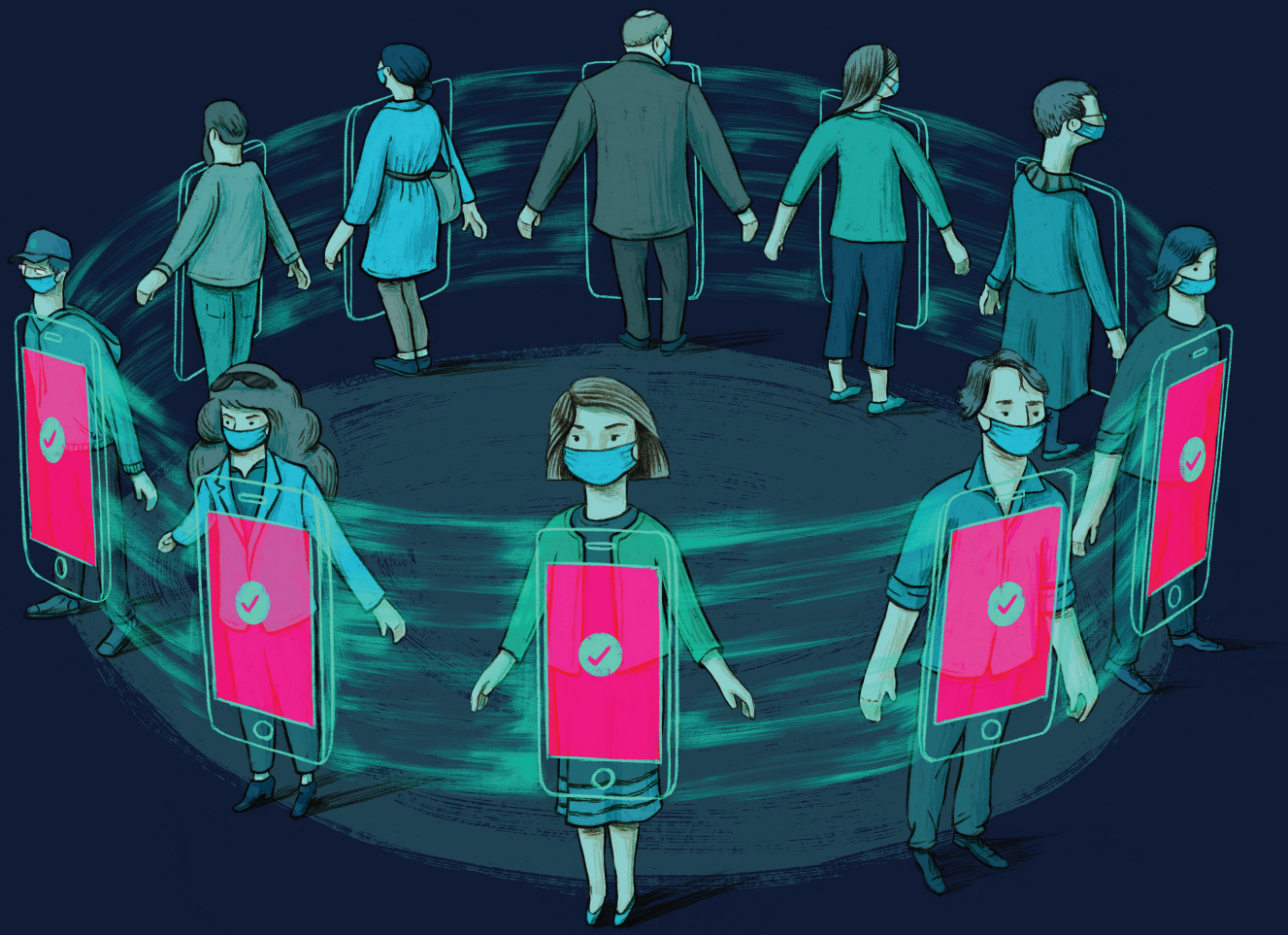

German-Israeli Tech Policy Dialog Program / November 2020

The German Corona-App: **Expectations, Debates and Results**

Ann Cathrin Riedel

Rethinking Privacy and Mass Surveillance in the Information Age

Paper Series by the Israel Public Policy Institute and Heinrich-Böll-Stiftung

The German Corona-App: Expectations, Debates and Results

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About the Project

The following paper has been commissioned by the Heinrich Böll Foundation and the Israel Public Policy Institute (IPPI) as part of the paper series "Rethinking Privacy and Mass Surveillance in the Information Age." Against the backdrop of the COVID-19 pandemic, this publication series has set out to examine the societal and political implications of the spillover of surveillance technologies from the security sphere into everyday life.

About the German-Israel Tech Policy Dialog Program

The paper series "Rethinking Privacy and Mass Surveillance in the Information Age" is part of the German-Israeli Tech Policy Dialog program of the Heinrich Böll Foundation and the Israel Public Policy Institute (IPPI). By facilitating a collaborative space for researchers and practitioners from politics, academia, tech and civil society, the program sets out to cultivate a community of committed professionals from both countries to deliberate the impact and governance of emerging technologies and to generate new actionable insights in support of democratic values.

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Executive Summary

The German Corona warning app is a success story. This paper tries – within the confines of its scope – to reflect on the complex debate which lasted more than three months up to its launch. This debate began already during the development of the app and even now, it remains unclear whether the benefits justify the costs. Although some commentators do not view the German Corona warning app as successful, this paper will present the app and especially the debate surrounding it as a success story, based on three aspects.

Active Democracy

Tracking or Tracing? Should we use the decentralized model with better data protection as backend for the app, or the centralized model, which would allow for conclusions to be drawn by epidemiologists? Should we choose complete transparency by open-source development and public participation or a closed-shop development? Should we have a legal basis for an app – yes or no? All these questions were thoroughly discussed by representatives from civil society, science, business and the federal government. There were frictions, misunderstandings and concessions. The development of the German Corona app took time, and yet we found that precisely due to the pluralistic, intense debate that accompanied it, we were able to develop one of the world's best Corona tracing apps in a relatively short time span. One should not forget that technological development takes time and cannot be accomplished overnight. The fact that the various stages – design, development, testing – were completed so fast and with a good result, without compromising on the societal discussions on how to achieve it, is far too little appreciated in Germany. And even if some do not view the app as effective, the contribution of the debate around it should be recognized.

Data Protection and Innovation: Compatible Priorities

"Data protection prevents innovation" is a common claim, invoked particularly when emphasizing the importance of innovative, data-driven ideas. However, data protection, insofar as it may limit data, is not an impediment to innovation, because when it comes to data, "more" is not necessarily "better." The same applies to ideas based on the use of data. Yet even in Germany, a country known all over the world for its position favoring data protection, one hears that the prioritization of data protection has made any innovation impossible.

The German Corona warning app proves that this is not true. Furthermore, data protection is not important only in the context of advancing digitalization with "European values" in mind (reflected in civil and human rights like the right to privacy); in times of surveillance capitalism it gains ever greater significance. This applies for all countries worldwide. The European Union should not just be a role model in this respect but should also create (more) standards. When new developments ignore the European values, which are also reflected in data protection, they may be new, but they cannot be considered innovative.

Technology Alone Does Not Solve Problems

A notion that is still in its infancy but will hopefully keep evolving is the acknowledgement that digitalization and technology, their contributions notwithstanding, can only be instruments for achieving solutions and not solutions in and of themselves. More technology, more data, more artificial intelligence – none of these can protect us from problems; and in the worst case they will create new problems or aggravate existing ones. This is not "tech pessimism" – quite the

contrary. The Coronavirus pandemic shows us (I hope) clearly how we can be realists who use technology for making our lives better, and also distinguish between when it is our personal behavior alone that determines if we will be able to solve problems. The belief that technology and digitalization resemble "magic," so-called "techsolutionism", will hopefully lose currency as a consequence of the pandemic. I urgently warn against yielding to the idea of collecting masses of data for the sake of "trying something," considering that the amount and intensity of surveillance by a large number of players are increasing worldwide.

1. Introduction

The German Corona warning app is mainly one thing: a successful didactic process. With 18.4 million downloads[1] by the end of September, it is one of the most frequently used tracing apps for slowing the spread of the novel Coronavirus SARS-CoV-2. However, the number of downloads alone is not what makes the app so successful in Germany. Its development also led to some important findings, such as the fact that the German healthcare system is lagging far behind with regard to digitalization. The undue time it is taking to connect testing laboratories with the Corona warning app system – a process that remains uncompleted as this report is being written – is just one of several examples. In addition to the lack of digitalization of the healthcare system, there is also a lack of understanding of the possibilities and limitations of digital tools and technologies, as well as of the time and perfection required for developing them. This is reflected, for example, in the words of the president of the Bundestag, i.e. the federal parliament, who said in late May 2020 that the debate about the development of the Corona warning app was a disaster, lamented how long it took to develop it and stated that this app should have been up and running already at the onset of the pandemic. He was right in pointing out that he was "not an expert."[2]

The novel Coronavirus has been spreading in Germany since January 27, 2020. On February 28, 2020, the Robert Koch Institute still considered the risk in Germany to be "low to moderate." Since March 26, 2020, it has been considered "very high." One day earlier the federal parliament stated that we had an "epidemic situation of national significance."[3] Roughly at that time the debate started in Germany about an app for fighting or curbing the spread of the Coronavirus. The use of the word "fighting" suggested to many that an app alone could do something to combat the virus. In addition to calling attention to the fact that our healthcare system is insufficiently digitalized, the debate about the Corona warning app in Germany led to the following realizations:

- Good and precise communication is essential;
- Data protection and innovation can be combined, and the combination leads to the best possible and most accepted solutions;
- Including civil society both in the debate and in the development by means of open-source solutions not only ensures broad support but also encourages trust in the finished product.

For these reasons, a committed civil society should not be seen as a hindering factor but as partner in developing this kind of products.

The process of developing the German Corona warning app and the debate about it should be understood as a blueprint for future digital development projects. This paper describes the debate about the app development with its various orientations and aspects. Since the debate was very complex and took place over almost three months, it is not possible to cover every detail. But by sketching out the overall process, I intend to show in particular that even when time is short, it is possible to conduct a democratic debate and comply with data protection requirements, in combination with innovation.

Image 1.

Logo of the Corona warning app introduced in Germany

Protecting basic rights and freedom, using technology for support where it is beneficial, trying novel approaches – all these are vital, especially during a pandemic. We must prevent – now and in future – a scenario in which a pandemic is exploited as a pretense to subject people to massive data collection and surveillance, also after the public health threat has passed.

2. Debate About the Corona Tracing App

2.1. Tracking or Tracing?

Because the epidemic continued to get worse in Germany, on March 27, 2020, the German parliament passed the "Act for the Protection of the Population in the Event of an Epidemic Situation of National Significance." Its first draft contained a stipulation that permitted the health authorities to use "technical means" "for the purpose of tracing contacts" and required telecommunication providers to deliver traffic and location data.[4] This proposal was presented with references – frequently raised during the ensuing debate – to experiences with using this kind of data, for instance in South Korea. It quickly became clear that the use of GPS-data was not a relevant model for Germany, that the use of the app alone could not stop the spreading of the virus. Further, it was learned that in South Korea many other data were used for contact tracing, including data from surveillance cameras and data related to financial transactions.[5] Such a scenario seemed unthinkable for Germany.

The idea of using GPS-data was abandoned for the sake of protecting privacy and because of protests by the civil society. Moreover, in mid-April 2020 all EU member states agreed in a joint paper not to use this type of data for fighting the pandemic.[6] Demands raised by civil society actors[7] and by MP Anke Domscheidt-Berg[8] made it clear that should GPS-data be used at all, it should be voluntary and decentralized, and done in a manner ensuring that movement profiles could not be related to individual persons. I will not describe the proposals in detail here.

2.2. Decentralized or Centralized?

The main characteristics chosen as the basis for the development of the tracing app were voluntary use, anonymous data collection and decentralized data storage. Rather than rely on tracking, such an app would not use the app-user's location data but save contacts of the persons who had installed the app.

The idea of using an app for contact tracing was specified in early April 2020. A group called PEPP-PT[9] (Pan-European Privacy-Preserving Proximity Tracing), comprising several companies and research institutes led (at least as far as the public knew) by entrepreneur Chris Boos, who is also member of the Digital Council of the federal government,[10] declared that they were developing a system that would allow contact tracing. The focus was on the so-called backend, i.e. the technology behind the app and not the app itself, so that particular apps would be developed separately (perhaps by each European country), using this backend as a basis. The model proposed by PEPP-PT is the so-called centralized model. Below I will explain its functioning by outlining the differences between the centralized and decentralized models. However, I will first describe briefly how contact tracing works in general.

Contact tracing uses a cryptographic process based on so-called keys. A smartphone where the app is installed generates a daily "temporary exposure key." This "key" never leaves the smartphone. Moreover, it is deleted after 14 days. This period is based on the assumption that persons infected with SARS-CoV-2 are able to spread the virus for 14 days only, rendering the key obsolete after this time. Based on this temporary exposure key, the software generates a "rolling proximity identifier key" by means of a cryptographic process, which in turn generates a rolling proximity identifier every 15 or 20 minutes. This identifier is the key exchanged by the user's own smartphone with smartphones in its vicinity by means of a low-energy Bluetooth (BLE) connection, provided that a compatible Corona tracing app is installed on these smartphones. The identifier itself is useless. A cryptographic one-way function prevents it from being used for gaining information or drawing any conclusions.

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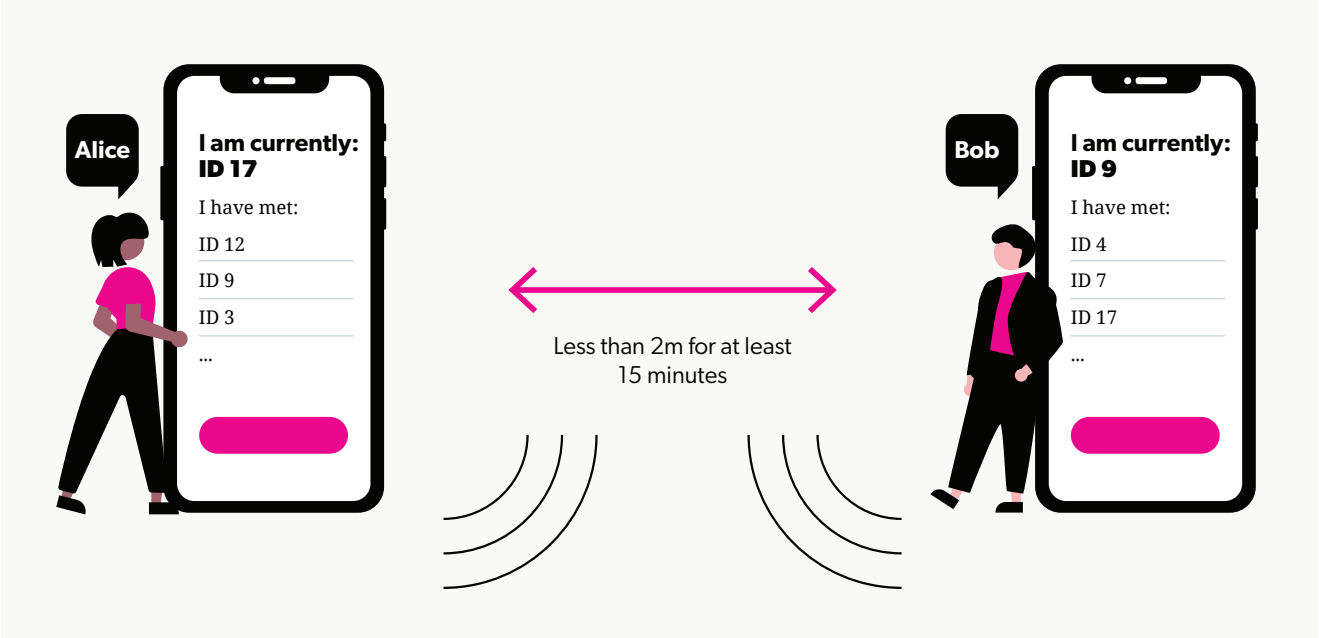
Figure 1.

How Does the Corona Warning App Work?



Schematic and simplified presentation of the functioning of the Corona tracing app.[11] Each phone will keep a "local" and anonymized record of all phones (carrying the app) with which it was in close proximity for longer than 15 minutes. The issued IDs are temporary but can be decrypted by the server.

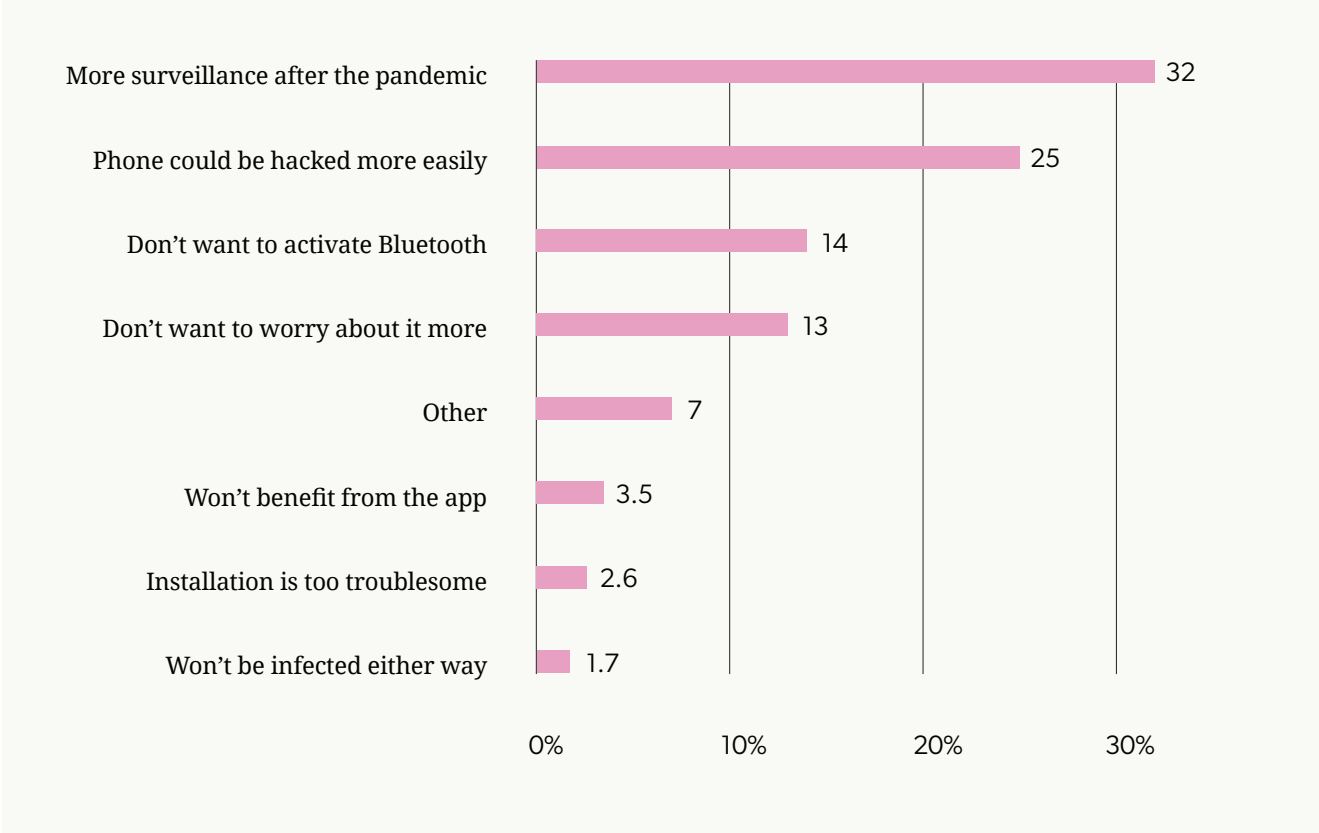
When a user enters a positive test result into their smartphone app, the system renames the temporary exposure keys of the days when that person was infectious into diagnosis keys. These diagnosis keys are in turn transmitted to a central server.

Both models use a central server. What accounts for the difference between the centralized and the decentralized backend models is the role it plays. In the centralized model proposed by PEPP-PT and the federal government, the central server compares the keys received with the keys reported as infected. If the comparison finds any matches between the two (using cryptographic processes for comparing identifiers with temporary exposure keys), the persons who were in close contact – for at least 15 minutes at a distance of less than 1.5 meters[12] – with the infected person receives a message. In the decentralized model, this comparison is made on the individual smartphones. The only function of the central server is to distribute the diagnosis keys.[13]

The federal government, in particular Federal Minister of Health Jens Spahn, supported the PEPP-PT group and their centralized model for a Corona tracing app. They continued to support it when a dispute about the approach occurred within the group in mid-April 2020. Apart from the IT-entrepreneur Chris Boos, Marcel Salathé, professor at the Swiss Federal Institute of Technology in Lausanne (EPFL), was the person appearing most frequently in the media. On April 17, 2020 professor Salathé distanced himself from PEPP-PT on Twitter, declaring that he thought the project was lacking in transparency. Openness and transparency were also very strongly demanded by many civil society organizations, in particular, those involved in internet policy such as the Chaos Computer Club and Stiftung Datenschutz (Foundation for Data Protection).

Figure 2.

Main Reasons against Installation of Corona App



Most cited reasons against the installation of a contact tracing app, based on a representative survey conducted March 25-27, 2020, among 1,041 German participants.[14]

Parallel to the development of the centralized model, a group of researchers developed the decentralized model, known as D3PT (Decentralized Privacy-Preserving Proximity Tracing). The developers using the D3PT approach increasingly distanced themselves from the larger project group,[15] including, for instance, researchers of the CISPA Helmholtz Center for Information Security in Saarbrücken.[16] The D3PT project group conducted all of its work as an open source project on GitHub,[17] a platform frequently used for this kind of activities. It allows to view the entire development process and even submit ideas for improvement or point out issues or weaknesses in the program code or in the system architecture.

As early as April 10, 2020, Google and Apple announced that they were willing to collaborate in a manner that had heretofore been unusual. Both companies are providers of the world's most frequently used smartphone operating systems: Android and iOS. The two companies announced jointly that they would provide the interfaces required for allowing the Corona tracing apps run as background software on smartphones with their operating systems (meaning that the apps would need not be restarted each time the phone was powered on, and would also work when the phone is locked), while ensuring low energy consumption and small data volumes. Moreover, both companies promised to publish the interfaces transparently and make them

accessible to authorized developers only.[18] During a hearing arranged by the Renew Europe group in the European parliament on April 24, 2020, the companies made it clear that they would support only the decentralized model for a Corona tracing app,[19] citing reasons of data protection and protection of privacy.[20]

In addition, the previously mentioned organizations active in internet policy, and others, supported the decentralized model in a joint open letter. Moreover, they demanded that Health Minister Spahn and Helge Braun, Head of the German Chancellery, ensure that the development be performed as an open source project and that anonymity of the users be guaranteed as much as possible.[21] Even before the open letter was released, 300 international scientists pointed out to the politicians in an urgent letter that "some solutions for the contact tracing apps being currently developed might secretly lead to systems that would make an unprecedented surveillance of the entire society possible." Systems that would enable a reconstruction of the "social graph" of a person should be rejected, said the authors of the letter, "without further discussion."[22]

The centralized model does not make it easy to draw conclusions regarding individual persons, but it makes it easier than the decentralized model. The main reason for the reservations on the part of experts affiliated with D3PT, however, was the lack of communication and transparency within the group that had formed around Chris Boos.[23] On the other hand, the advantage of the decentralized model is that the data could help epidemiologists study the spread of the virus, as well as make it easier for developers to adjust the system, e.g. change variables such as the distance between two devices. To date, the French government is one of the few European governments using this centralized model, which is still not supported by Google and Apple.[24]

Because of the immense pressure exercised by civil society and scientists, and the refusal of the two tech-giants to give in, the federal government changed tack on April 26, 2020 and from that date, it shifted its support to the decentralized model as backend for the German Corona tracing app.[25] The European Commission also decided to use the decentralized approach.[26]

2.3. More Than IT-Security and Data Protection

Main aspects of the discussion about a Corona tracing app in Germany were IT-security and data protection. Quite justly, the discussion focused very much on the protection of civil rights and the fear that a surveillance infrastructure might be developed. This was so not only because German citizens did not want it, but also because such an infrastructure might also then be used as model in other countries, and then exploited, for instance in countries with an autocratic government. The fear of surveillance and weakened IT-security was the main reason why the German population did not want to install an app in March. There is no doubt that this fear has to be taken into account and that it is very important to discuss it in connection with developing a technology.

One aspect that has been insufficiently debated to date is the question as to the impact the design of such an app on people. The point is that the app is not an end in itself but an instrument people can use to prevent spread of the virus. This is why it has to be adapted to their needs and be embedded in a set of measures. A Corona

tracing app does not function as an isolated instrument, but only in combination with analogue measures, beginning with a positive test result, which somehow has to be transmitted to the app.

One question regarding the app design was, for instance, if it was a good idea to send the information that a person might have been exposed to an infected person as a push notifications. These push notifications might arrive often, as one of many other notifications, e.g. WhatsApp messages or notifications reporting urgent news. What impact might such a notification have on persons, especially those at higher risk because they suffer from some other disease? The question as to how to manage a risk or the probability of contagion was insufficiently considered (especially in the public debate) before the app was developed: "Few people understand what probability means. Just ask yourself: When there is a 60% probability that it might rain, would you take an umbrella with you or not? Is a 'risk score' whose derivation is not clear, a clever way to inform the app users? Will it not make many feel rather nervous?"[27]

In addition to all this, the actions that one must take following a warning issued by the app were stipulated only at a later stage. Would people have to go into quarantine? Would they be entitled to a free test? Who would take over childcare while a test result was pending, if one would want to minimize further risk to one's children? Would people be entitled to ongoing wages? As of August 7, 2020, the warnings issued by the app did not entail a requirement to enter quarantine, nor did they make people eligible for free testing. Instead, the warning issued by the app simply called upon users to contact the healthcare system."[28]

Another criticism of the app as the key strategy to control the pandemic mechanism was the inherent socio-economic discrimination: For people to participate and benefit from the contact tracing app, they must poses a smartphone and have access to the internet. In addition, in order for the app to truly benefit all, persons with physical or cognitive limitations must be able to participate, as well as foreign tourists and business travelers or persons who are either too young to use the app or for whom its use is too demanding (approximately 21% of German citizens do not own a smartphone). Additional groups that must be considered are persons who do own a smartphone but one with an operating system other than Android or iOS or whose smartphone is too old and either does not support the most recent operating systems and/or does not have BLE.[29]

One can understand how invisible the potential discrimination inherent in blanket adoption of the app as a strategy can be, when remembering statements by some politicians made during the debate. For instance, Axel Voss, a European MP from the German Christian Democratic Party, demanded that persons who had installed an app "[should be] among the first to be allowed to go to restaurants, cinemas, theaters or swimming pools again."[30] The idea that the use of an app should be compulsory – required either by the state or by private entities – appeared later in a debate about an auxiliary law relating to the introduction of the German Corona warning app. The federal government assured the public that using the app would remain entirely voluntary.[31]

3. The German Corona Warning App – Ultimate Implementation

"When will it arrive?" many journalists kept asking from mid-May 2020. The fact that the German Corona-Warn-App[32] was late to be launched was often misrepresented as a "quarrel" among data protection experts as to the validity of the project itself. Rather, the "quarrel" was a debate regarding "how" and not "if." Let me explain this situation in detail.

Two German companies, SAP and Deutsche Telekom, were ordered to develop, provide and operate the app and the necessary infrastructure.[33] The app was developed as open source project on the abovementioned platform GitHub,[34] which was not typical for the two companies but had been required by scientists and civil society.[35] The discussion on GitHub between the community and the companies can be described as positive. A complicating factor was that third parties, in particular journalists, could also follow the discussion and report about it. These third parties often perceived proposals for improving the app's source code or its architecture as criticism, and thus published misleading information, namely, they alleged that there were "quarrels" between the supporters of the centralized and decentralized models. This portrayal was one reason why many withdrew their participation from the work on the open source project. The climate – influenced inter alia by the way the media were reporting about it – no longer allowed for constructive collaboration.[36] When SAP and Telekom published the information that 65,000 software developers had participated in the project, this also caused confusion. This figure resulted from the fact that they assumed that any person visiting the GitHub-site had programming expertise and that all visitors had also actually contributed actively to the project on the platform.[37] How many persons really did contribute has not yet been determined.

Professor Ulrich Kelber, Federal Commissioner for Data Protection and Freedom of Information (BfDI), was also involved in developing the app. When the app was released, he claimed that its data protection was sufficient and that there were no reasons to refrain from installing it, although he did admit that it still had weaknesses that had to be resolved by the relevant authorities and companies.[38]

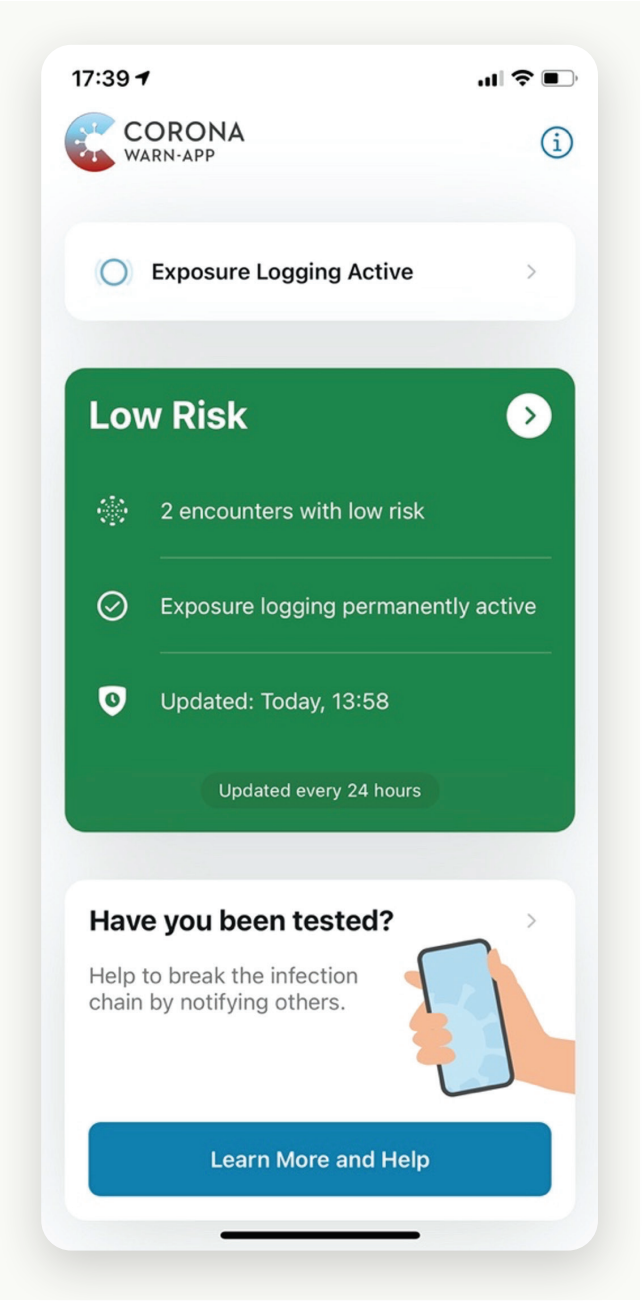
Contrary to the frequently raised claim that the app was introduced too late, the fact that it "took so long" had some advantages. The German Corona warning app, was finally released on June 16, 2020,[39] with the Robert Koch Institute as its operator.[40] It was the first to implement the interfaces provided by Apple and Google,[41] which were required for optimal functioning. Already during the first 24 hours, it was downloaded 6.4 million times. However, it turned out that the app did not work on older smartphones such as iPhone models 6, 5S or 5, since they are not compatible with the operating system update that is required for the interfaces.[42] After 100 days, the Corona warning app had been downloaded 18.2 million times.[43]

Developing the German app cost approximately 20 million Euro; of these, 9.5 million went to SAP and approximately 7.8 million to T-Systems, a subsidiary of Deutsche Telekom. Three and a half million Euro were spent on advertising. IT-security tests cost 107,100 Euro. The cost for operating the app is much higher. Maintenance by SAP will cost 1.9 million Euro for the coming

two years. The operation of the app by T-Systems including maintenance, security, network and hotline, costs approximately 43 million Euro.[44]

According to the original plans, using the Corona warning app was to be completely pseudonymous. However, this could not be ensured, especially when it was first released, as integrating test laboratories into the app's system took time. Ideally, persons with a positive test result were to receive a QR-code from the laboratory and enter this code (voluntarily) in the app so that the app could send anonymous warnings to every other phone that had been in close contact during the previous two weeks. A system to transmit TANs via telephone was established, so that the app could send warnings also without a QR-code or if the QR-code were illegible. Persons with positive test results could call a verification hotline, where they would be required to answer a number of questions to make sure that the system was not abused by trolls. Once the questions were answered satisfactorily, the callers would be given a transaction authentication number (TAN) to enter in the app and the app would then issue the warnings.[45] To date no major manipulations via the telephone hotline were reported. As of September 25, 2020, 15 out of more than 100 laboratories were not covered by the app's infrastructure. According to the laboratory operators, the reason for this was that the app's infrastructure was compatible only with Windows servers and not with Linux servers. Deutsche Telekom claims, however, that they offer a solution that does not require a particular operating system. Another inhibiting factor is that the cost for integration in the system has to be covered by the laboratories.[46]

Image 2.
Screenshot of the Corona warning app

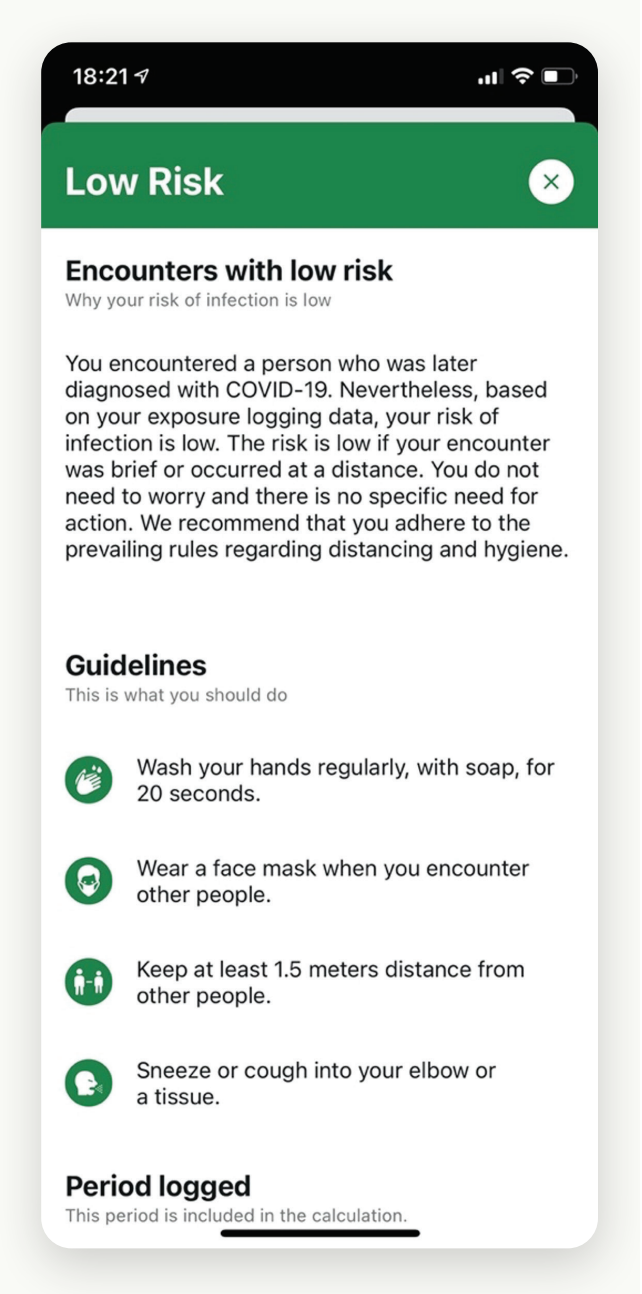


An additional issue that was noticed only after the app was published and that deserves mention here is its confusing design, or rather confusing information that appeared in the user interface. In its first version, the app included a counting mechanism that said that the app was active "for X out of 14 days". On social media channels people asked jokingly what would happen after those 14 days. On the 15th day after the app's publication some users reported that the indication was "active for 15 out of 14 days"; on other people's smartphones the counter got stuck at 14. Yet others reported that the counter had gone back to smaller numbers. What exactly this indicator was supposed to mean was not clear. An update first corrected the error and later the counter was removed entirely. Currently the app shows only when it was last updated (see Image 2). The counter actually was supposed to express that the so-called Temporary Exposure Keys were deleted after 14 days and meetings from that period had no further influence on the risk assessment for the user. However, the form in which this was presented was not clear.[47]

Confusion was caused also by the fact that the app said there had been risky encounters but claimed that the risk was still low, i.e. in the green range (see Image 2). The Robert Koch Institute explained that this meant that there had been contact with a person who had tested positive, but that person had been too far away or the encounter was too short or both. The Robert Koch Institute wanted to keep the users informed about these encounters, too.[48]

Image 3.

Explanation of the meaning of "Encounters with low risk" in the Corona warning app



4. Response to the Corona Warning App

4.1. Organizations Active in Internet Policy

As stated above, various representatives of civil society and scientists were involved in the debate and the final design of the app. Their committed involvement was certainly instrumental in ensuring that the use of the app was voluntary, that it fulfilled the strictest requirements with regard to data protection and privacy and that its development was an open source project. The parties involved had many debates about the Corona tracing app. In addition, the media closely accompanied and commented on the developments.

In addition to the organizations engaged in digital policy, namely LOAD e.V. – Verein für liberale Netzpolitik (Association for a Liberal Internet Policy), where the author preside as chairwoman, and D64 – Zentrum für digitalen Fortschritt e.V. (Center for Digital Progress), a number of other organizations were substantial and often quoted commentators in the debate, including Gesellschaft für Informatik e.V. (German Informatics Society), Forum InformatikerInnen für Frieden und gesellschaftliche Verantwortung e.V. (Forum of Computer Scientists for Peace and Social Responsibility), and the previously mentioned Stiftung Datenschutz and Chaos Computer Club. We must also not forget to mention the many developers who participated in designing the app via the platform GitHub. Many scientists participated, too, in particular experts for data protection, as mentioned above.

Up to the moment when the app was published, almost everyone who had a hand in shaping the development the app thought it was good or very good. All of them either recommended installing it or did not make any statements at all. The author is not aware of any members of this community having cautioned people against installing the Corona warning app. This was a novelty and a surprise to some, since in most other cases in Germany it is unfortunately standard that the outcome of digital (policy) projects run by the federal government is met with criticism in particular by civil rights representatives; and quite often, the government is taken to the Federal Constitutional Court at Karlsruhe to challenge these outcomes. Linus Neumann, speaker of the Chaos Computer Club, commented the publication of the Corona warning app by saying: “Also for us, it is not an everyday experience that we warn against risks and that the federal government listens to us. I am now in the situation that I cannot complain about any major faults in something that was developed by SAP, Deutsche Telekom and the federal government. This situation is difficult for me,” he added, unable to stop himself from grinning at the end.[49]

4.2. Criticizing the Debate About the Corona Warning App

Journalists over time have often criticized the “worries concerning data protection” of the abovementioned groups but nearly none of them were experts in the fields of technology and digitalization. For example, Jasper von Altenbockum, domestic policy editor of the Frankfurter Allgemeine Zeitung, called the debate about the Corona warning app “the most embarrassing aspect of the Corona crisis” in an

opinion published in late April. The participants of the debate, he wrote, indulged in "nerdy bickering and self-absorbed hysterics about surveillance".[50] In a similar vein, Wolfgang Bauer, journalist and war correspondent, wrote a detailed opinion for Die Zeit demanding to protect not data but lives.[51] He forgot that data protection is not about protecting data, i.e. information, but humans as individuals.

Both examples reveal wildly unrealistic expectations regarding protective capabilities of data and technology held among members of the public, both during the debate accompanying the development of the Corona warning app and beyond it. This experience confirms that the fantasy of "techsolutionism" should urgently be tackled. The immense expectations connected with the app were also based on the fact that at the onset of the pandemic, there had been some suggestion that the app was the solution or the essential factor for fighting the pandemic. The author of this paper pointed this out in many interviews.[52] When the app was eventually published, the federal government took care to point out that the app was "not a silver bullet."[53]

The expectations were not created by evidence-based experience with such an app. There is no long-term experience anywhere in the world using an app to fight a pandemic. Experience from Asia, for example, was only incompletely taken into account in the debate in Germany. Here, while more than 100 international organizations warned against the risk of increasing digital surveillance in connection with the pandemic, others – including the two journalists mentioned above – completely dismissed their concerns or called the risk negligible. Yet the organizations were simply urging to consider the benefits of an app relative to the costs: "Technology can and should play an important role during this effort to save lives, such as to spread public health messages and expand access to healthcare," emphasized Access Now, among the 100 groups to sign a joint statement. "However, an increase in state digital surveillance powers — such as obtaining access to mobile phone location data — threatens privacy, freedom of expression, and freedom of association. Further, violating these rights degrades trust in public authorities, undermining the effectiveness of any public health response."[54]

4.3. Data Protection Impact Study and Corona Tracing Law

This review would be incomplete without acknowledging that the Forum InformatikerInnen für Frieden und gesellschaftliche Verantwortung e.V. identified "specific prominent methodological, technical, and legal shortcomings" in the Data Protection Impact Study for the Company warning app.[55] The organization also pointed out that there was no law regulating the app, and warned that its use must remain voluntary. Clear legislation on the matter could, for example, prevent the operators of public swimming pools, or other private business owners, from requiring patrons to install the app as a condition to receive service. A group of civil society representatives even drafted a proposal for such an accompanying law, meant to set concrete limitations, on their own initiative.[56] However, the federal government denies that such a law is needed.[57] Also among the opposition, there is disagreement: the parties Bündnis90/Die Grünen (Alliance90/The Greens) and Die Linke are in favor of creating a legal basis for the tracing app while the liberal democrats do not think it is necessary.[58]

5. Acceptance by the Population and Benefit to Date

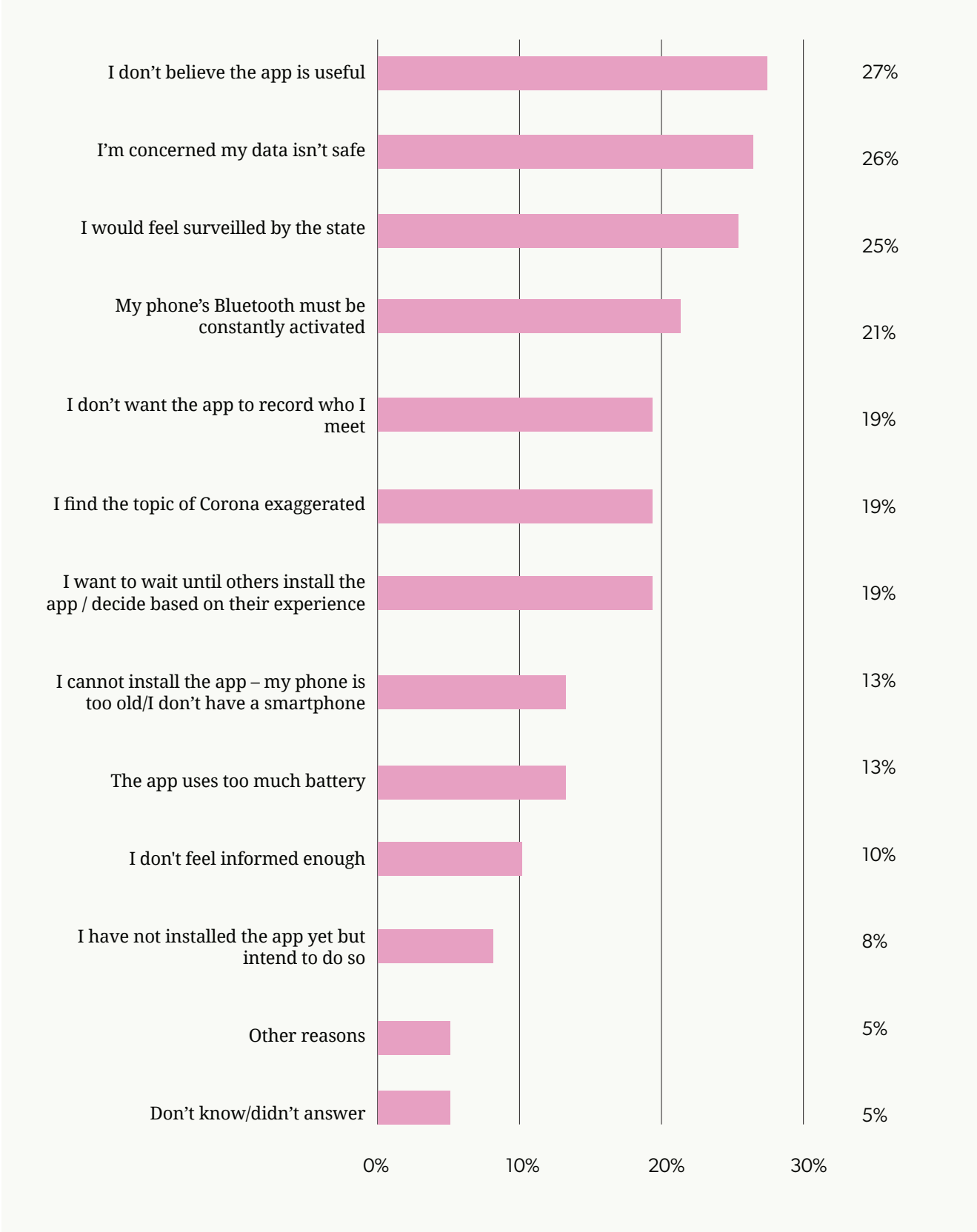
Charged with great expectations (buzz word: “techsolutionism”), the Corona warning app was launched in mid-June 2020. As mentioned above, it had been downloaded more than 18 million times by the end of September 2020, far exceeding any expectations. However, the number of actual users is less because the number of downloads alone does not indicate the number of users. Experts estimate that the number of actual users is 80% of the number of downloads. This would only be approximately 18% of the people living in Germany, which is a rather small part of the population.[59] It was often claimed that at least 60% of the population of a country would have to use a tracing app so that it could prove its full worth, but this is said to be a misinterpretation of a study by Oxford University. Whatever the actual numbers, there is no question that a large number of users will correlate with an increase in effectiveness.[60]

Because the app has been designed with data protection and economical use of data in mind, it does not allow many ways of accurately assessing its uptake, use and effectiveness.

Because the app has been designed with data protection and economical use of data in mind, it does not allow many ways of accurately assessing its uptake, use and effectiveness. According to estimates published by Health Minister Spahn based on the number of telephone TANs and QR-codes issued, 15,450 infections should have been reported through the app. However, only slightly less than 5,000 infections were actually reported. This means that only every third person using the app actually entered the test result in the app so that contacts could be warned. This shows that people still do not believe that contact tracing through the app is really anonymous, or they don't trust technology in general (see Figure 3).[61]

Figure 3.

Reasons for Not Wanting to Install the Corona Warning App



Responses to the question "why haven't you installed the Corona warning app on your phone?" based on an online survey conducted in Germany on June 17-19, 2020, among 1,486 participants.[62]

Even if some parties claim the Corona warning app was used for monitoring the population, this kind of conspiracy theory has not yet been widely spread or made its way to the media. Other conspiracy theories like the claim that the virus actually did not exist or was spread by 5G mobile communication antennas or that Bill Gates intended to use it to implant a chip in people are much more commonplace. Whether the transparent development of the app contributed to its not becoming a major element in conspiracy theories remains to be studied.

6. Conclusions

"Mr. Speaker, I wonder whether the right honorable gentleman can name a single country in the world that has a functional contact tracing app? Because there isn't one," asked Boris Johnson, British Prime Minister, in June in the British Parliament. "Germany," answered MP Keir Starmer, "app working on June 15, 12 million downloads."[63] Admittedly, although many associations, organizations and companies have advertised the German Corona warning app, they have not able to convince everyone to install it and to actually use it when they were tested positive. And yet, in general, the result so far can be considered to be positive – especially if tracing was connected with realistic expectations rather than being seen as panacea for fighting the pandemic.

The German Corona warning app is a blueprint for the productive collaboration of civil society, science and the federal government. The result is a product which is in compliance with the European values with regard to data protection and civil rights. It is not an instrument that could be used for mass surveillance of the population if it got into the wrong hands. It also suggests that data protection and innovation can be combined, without compromising on the results. It is questionable if more data (as demanded by some parties) would actually lead to better results in fighting the pandemic, since no country in the world has been able to prove up to now that technology alone or as main factor could make such an impact – not even countries collecting immense amounts of data from the population. Even more than contact tracing, it is rather a combination of a good testing strategy, quick containment and compliance with the rules for hygiene (distance, hygiene, covering mouth and nose), that keep infection figures low.

Especially with a view to the fact that the security laws adopted in Germany and Europe after the terror attacks of September 11, 2001 in the United States, which have not been revoked to date, it is urgently necessary to warn against the collection of masses of personal data and creating movement profiles. Unfortunately, previous experience shows that it cannot be assumed that they would only be used for fighting the pandemic and be deleted once the pandemic was over – whenever this would be. In Germany, for example, restaurants may keep guest lists that are then used by the police for prosecuting crimes[64] – which illustrates why warnings by civil rights activists should not be brushed aside lightly.

As mentioned before, also the criticism of the so-called "quarrel" among data protections experts and internet policy professionals surrounding the Corona tracing app was often not justified. The reason is that a debate about a solution or the best possible way to it is not necessarily a negative disagreement. On the contrary –

German society should be glad that this was an exercise of democracy. A dispute in the best sense of this word leads to the best possible outcome, and in this case, the best possible product, in the form of the Corona warning app. The fact that "only" approximately 18% of the people living in Germany are using the app despite the enormous support by experts is likewise a finding that can be considered, but not a negation of the apps value. Other causes are likely at play, such as a generalized lack of trust among the population at large.

The democratic debate that took place in Germany between the involved parties must be a blueprint for other (digital) projects. In the end, all of the parties involved want to achieve the best possible result for society. The point is almost never to stop the entire project. Negotiating the best way to achieve something should be welcomed and supported. The fact that it took "so long" to develop the app turned out to be an advantage. This aspect is often underestimated. Another aspect is that it is not possible to create apps and the system architecture required for them overnight, even if many seem to believe this. Moreover, whether the costs and benefits of the Corona warning app are well balanced has yet to be assessed, but one thing it clear: Technology can always only support people in solving their problems. It is never the solution itself.

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Ann Cathrin accompanies the work of Mittelstand 4.0-Kompetenzzentrum IT-Wirtschaft und des Co:Lab – Denklabor & Kollaborationsplattform für Gesellschaft & Digitalisierung e.V. as member of the advisory board. In these various roles, she lectures regularly about ethics and civil rights, freedom of opinion and digital communication as well as digital sovereignty.

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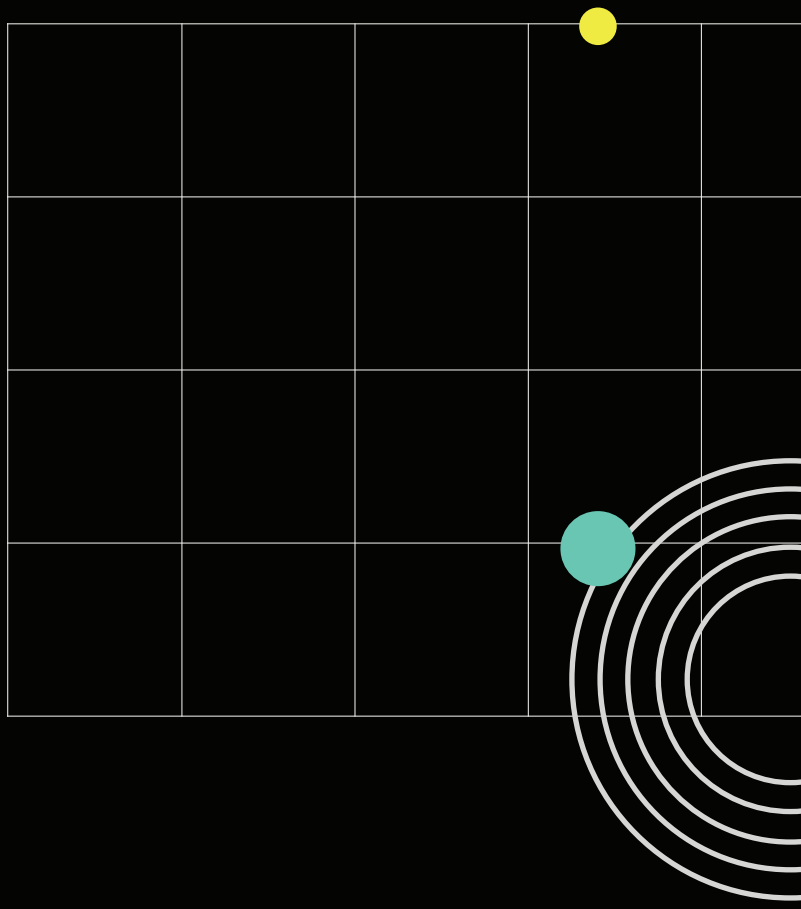

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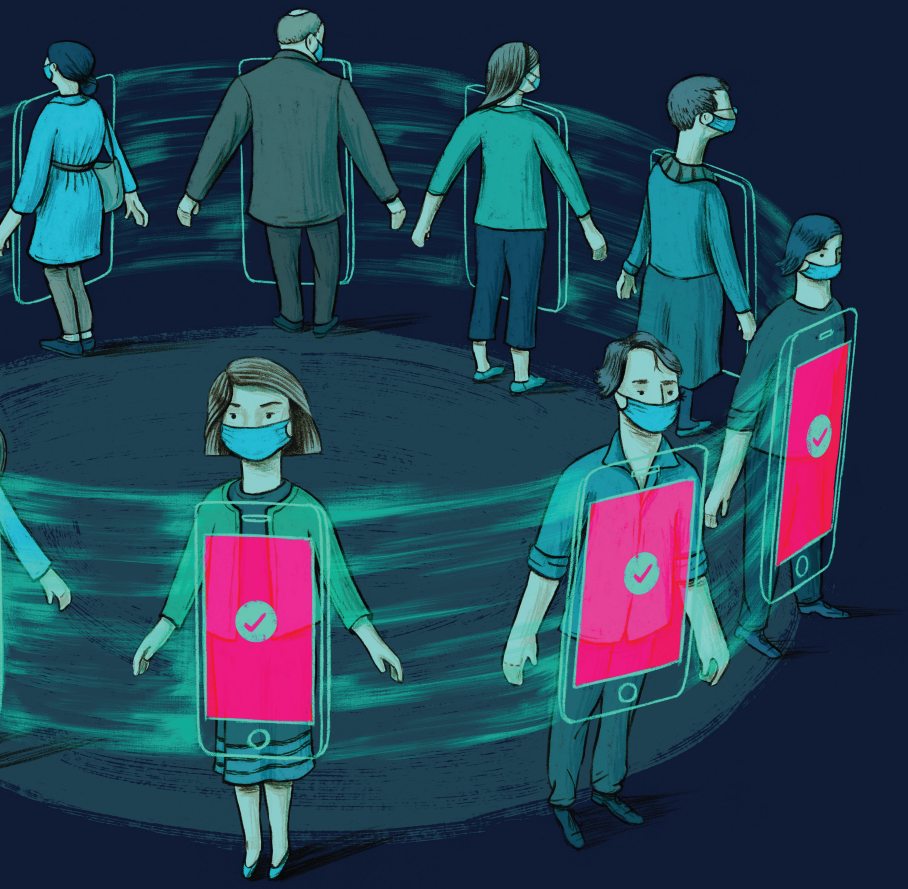

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