



HUMAN TECHNOLOGY  
FOUNDATION



# TECHNOLOGY GOVERNANCE DURING CRISES

COVID-19 RELATED DECISION SUPPORT

# SYNTHESIS

NEVER BEFORE HAS A PANDEMIC SPREAD ACROSS A WORLD SO ABUNDANT IN TECHNOLOGIES AND DATA. WHILE UNABLE TO SUFFICIENTLY PREDICT THE IMPACT OF COVID-19 FROM ITS ONSET, **THE POWER OF DIGITAL TECHNOLOGY HAS BEEN LEVERAGED EVERYWHERE** TO ACCELERATE SCIENTIFIC RESEARCH, LIMIT THE SPREAD OF THE EPIDEMIC AND NOW FACILITATE THE REOPENING OF BUSINESSES.

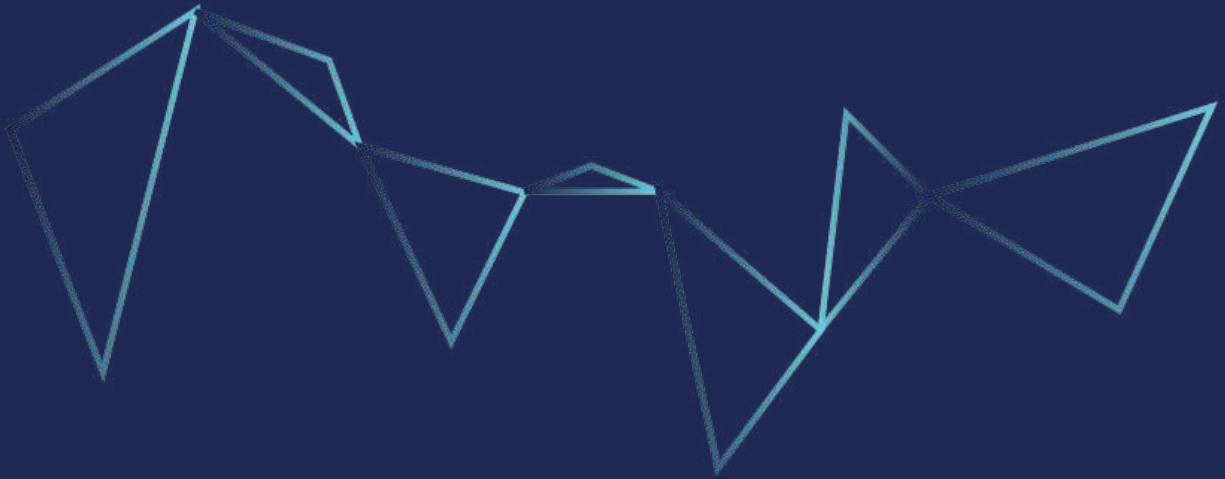
2 However, use of this significant power can also present risks and cause concern that may even slow the adoption of proposed solutions. In particular, the **effectiveness of health measures, safeguarding for individual liberties, digital sovereignty, social inclusion** and **widespread adoption** of the proposed measures are the issues at stake. Often caught up in a tangle of constraints or contradictory orders, public and private decision-makers are faced with choosing between the lesser of two evils.

**This report and its proposed methodology are primarily addressed to such decision-makers.** This approach aims to provide them with the means for analyzing and deciding on the use of technologies to exit the crisis and accelerate a healthy return to normal.

Although developed during the COVID-19 crisis, **the proposed method can be used to implement any IT-based response during a crisis** whose adoption and proper use involve fundamental ethical considerations.

This approach can be extended to **other areas of healthcare**, where the crisis has catalyzed underlying existing trends, paving the way for increasingly digital and data-intensive health services. Even more broadly, this method could be adapted to **make ethics a facilitator rather than a constraint** for the development of digital services whose sensitive nature requires a contextualized approach in our democratic societies.

Our proposed **methodological approach** consists of several stages: setting up a multipartite **governance body** for piloting the project from design stage through return to “normal” health conditions; developing a **single framework; clearly identifying the need**, taking into account the **overall health system** in which the IT-based solutions are implemented; and performing in-depth analyses of the **available technologies** and the technical, safety, ethical and legal issues at stake.



The proposed decision-making process is based on a **multifactor matrix**, to identify the risks and how to mitigate them, prepare the conditions for broad adoption of the chosen measures, and determine the conditions for their governance and evolution over time.

This report is made up of three main parts:

- The first part focuses on the **anthropological, social and ethical aspects related to the IT-based issues and the means for exiting the health crisis.**
- The second part provides an overview of the main technologies available with regard to health, technical and societal issues. Particular attention is paid to the most impactful issues, such as the nature of the data collected, how they are processed and stored (centralized/decentralized/hybrid), the security aspects related to the technology used, etc. The aim is to **make the IT-based aspect accessible to decision-makers.**

- The third part sets out in detail the **methodology and accompanying tools. The method has been fully applied to a selection of responses illustrating the diversity of anti-COVID-19 IT-based solutions developed around the world.** Eleven solutions were analyzed in depth by an international team of technology, health, ethics and legal experts. **The results and lessons learned from this work are highlighted in the different sections of the report and inform our recommendations.**

This method is covered in detail in the full report “Technology governance during crises” which is an open use document.



# CHAPTER 1

## BACKGROUND AND PERSPECTIVES

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The **social acceptability** of using a technology does not depend solely on its accessibility, effectiveness, explainability and easy applicability for a wide audience, or on the related technical, legal and ethical precautions. Our level of buy-in also depends on the frameworks we use to understand the unknown based on what we know. This crisis has led to a real **conflict in frameworks**, each of which can introduce its own **biases** when determining the measures to implement.

Such biases influence both decision-makers and those directly affected by the implemented measures as they predetermine specific solutions for some and rejections and objections for others. Every decision-maker and every community must therefore be able to speak accurately about the problems encountered if they wish to find a tailored solution. To that end, it is essential to know what **tone to take**, and the **consequences or implications** of such a choice.

Accordingly, references to **serious epidemics from the past** such as the plague, cholera or AIDS appeal strongly to our imagination, leading us to overreact to or, at the other extreme, downplay the seriousness of COVID-19. The possibility of **mass** monitoring prompts us to consider the use of technology as irreconcilable with the safe-guarding of individual freedoms. References to **war** and **terrorism** shift responsibility for defending ourselves to the State which implies that the danger is external, whereas we can all be carriers of the virus and are therefore all partly responsible for the solution.

In this current context where IT-based responses are sometimes equated by the public with monitoring and sometimes with war or terrorism, the question of **temporality** seems crucial for decision-makers. Governments must determine the **criteria used to define a state of emergency**, the conditions under which the exceptional crisis measures can be lifted and those that require the reactivation exceptional measures to prevent a new epidemic.





For businesses, the challenge is to ensure that practices for controlling access to premises or for managing private spaces in the workplace are not allowed to continue after the crisis, as this could create **distrust** and lead to a state of emergency that would become or be perceived as permanent.

The danger would in effect be the gradual **trivialization** of the use of tracking technologies and **becoming accustomed** to the practice of monitoring citizens and employees. The frameworks we have reviewed make us aware of the impact they can have on our perceptions and decisions and taking those into account can inform both governments and companies on the choice of appropriate technologies and governance methods.

However, other more enlightened conceptual frameworks can be used. A case in point is **our relationship with nature**, which requires us to become collectively aware of our shared responsibility in the current crisis. **The framework of care**, which is by far the most constructive, **calls for a continuous search for the right compromise between the need for freedom of choice for individuals and each person's responsibility for others, while paying particular attention to the protection of the most vulnerable populations.** Thinking of the current situation in terms of care therefore implies that crisis exit strategies should be based on principles of **inclusive governance, dialogue, solidarity and equity, accountability and trust.**



## CHAPTER 2

# UNDERSTANDING THE CHARACTERISTICS OF TECHNOLOGIES

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The selection of a **technology is never neutral**, in particular because of the conditions of acceptability and governance imposed by its effective and proportionate use. With this in mind, we analyzed IT-based approaches to exiting the crisis and re-opening businesses in four areas: **tracing** individuals carrying the virus, **studying behaviour** at a collective level, **monitoring compliance** with health measures and **controlling access** to private spaces. For each area, the **choice of IT architectures and governance methods for the devices** are closely linked, so decisions need to be made with respect to this inseparable whole.

Some dozen tracing applications developed throughout the world were analyzed. The **risks** that these technologies could present were also assessed, as well as the **options available to mitigate them**. These considerations may assist decision-makers in the **selection** processes to be carried out in a highly complex context dictated by emergency.

The important challenges identified in this work include the **nature and accuracy of the data** collected (GPS location data vs. Bluetooth proximity data), application **interoperability** both nationally and internationally, and **interdependence** with third party systems.

There is lively public debate on the choice between a **centralized** or **decentralized** system. Our analysis shows that this **apparent dichotomy** must be nuanced: many responses are hybrid, integrating both centralized and decentralized components. However, this is a particularly **impactful** decision, both in terms of IT security measures and respect for individual rights, as well as in terms of governance arrangements. Effective technologies can be used without sacrificing our individual freedoms and fundamental rights.

An informed choice of technologies requires knowledge of their underlying technical characteristics. And understanding of the technical aspects must be shared — through an appropriate **educational initiative** — across an entire organization or population in order to foster buy-in. To limit any digital divide, inclusiveness and information are required (Do your employees know what Bluetooth is, how a blockchain works, where data is stored? Do you intend to disclose your technology's potential percentage of false positives, etc.?) Governments and businesses must take care not to compound the consequences of unequal access to technology or risk penalizing those who are already largely excluded from the digital world. Moreover, the information provided to users must make it





very clear that no application can be considered as a medical device, despite the notifications and guidelines, and that it is not a substitute for a screening test.

Comparisons drawn from benchmarking tracing applications help to illustrate the questions that need to be asked. These issues also apply to the deployment of other types of technologies (connected devices, thermal cameras, AI systems, blockchains, etc.), with the benchmarking process adapted to the particular features of each planned project.

Given the circumstances, decision-makers must develop a critical view with regard to selecting IT-based solutions. For example, where the computer code for a proposed tool has not been checked by independent third parties, there is no guarantee it will process the data as stated by the project promoter. For that reason, we recommend creating an independent control body, as part of a governance system, and third-party auditability within the company. We believe that technology solution providers should be required to carry out independent and publicly accessible impact assessments.

Technical measures alone will certainly not suffice to guarantee that individuals are protected. Governments must bear in mind the importance of the **legislative, social and political** context in which such solutions could be deployed. Accordingly, it would be necessary to enact appropriate legal and regulatory provisions to safeguard individual freedoms and fundamental rights and to avoid discriminating against or stigmatizing certain groups.

Finally, beyond or additionally to any immediate objectives for a technology's usefulness, decision-makers would have to factor **clean transition** needs into the preferred IT-based solution. The health crisis must not overshadow the climate crisis facing humanity.



## CHAPTER 3

### DEFINING A

### GOVERNANCE MODEL

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By basing our understanding of the situation on the appropriate frame of reference and armed with detailed knowledge of the various technologies available, we can build a strategy using technology to combat the pandemic, restart economic activity and, more generally, operate in the post-crisis landscape.

To make the most appropriate choices and ensure the project is positively received, we recommend a method based on **some form of participatory governance**. In fact, the specific nature of pandemic risk implies that resuming economic and social activity requires that organizations develop a type of **herd immunity and resilience**. This approach calls for active buy-in and responsibility on the part of everyone within an ethical culture of technology use. It requires a participatory approach that can put IT-based choices in context and build in the diversity of real-life situations experienced by the different stakeholders and the ethical issues they face. Moreover, the inextricable link between the technical, legal and ethical aspects obliges us to address the issue of deploying IT-based

tools systemically. We therefore recommend a **multi-factor analysis** method implemented by a **multidisciplinary** team.

In practical terms, to implement the method advocated here, the **first step is to set up an appropriate governance body**, involving representatives of all stakeholders who have technical, legal and ethical expertise. This body will guide the project end to end.

First, we recommend that this group familiarize itself with the principles and contextual elements set out in the full version of the report, which could serve as a common **reference framework**.

It would then have the background to qualify needs, around the organization's imperatives, but also on the basis of **field realities** such as professional practices, habits and concerns, as perceived through user experiences. This approach allows for identifying the constraints as well as the elements of effective solutions put forward by stakeholders in the field.





During this phase, it would be important to remain focused on **expressions of needs**, seen through users' eyes, and not be too hasty in embracing technological solutions. A comprehensive response to the situation in which IT-based tools would be used should be developed.

With the organization's needs identified, the **typology of technologies** available and the examples presented in the report could help in selecting the option to implement. Once a process is outlined and a technological solution chosen, the **analysis grid** in the appendix of the report could facilitate **validation of these decisions**. Its aim is to encourage decision-makers to **ask the right questions from the outset of the project** and provide both a big-picture and a granular view of the technology under consideration. The process rolls out in seven steps, identifying questions that allow the proposed system's suitability to be assessed against the imperative of serving both the public interest and users' needs.

This process provides for making **trade-offs** and **prioritizing** the principles we believe must be upheld. This approach leads to establishing a framework of common rules and may include constraints or restrictions, which must be accepted and built in to be **effectively applied over time**.

# CONCLUSION

In view of the many unknowns surrounding the virus and the factors of contagion, our societies must prepare to live with the threat of pandemic. The end of the crisis expected by the public therefore requires **shifting from health disaster management mode to a medium-term risk management process**. IT-based solutions to assist with deconfinement and economic recovery may thus be studied only as part of a broader risk management process that includes health measures, support for potentially infected people, and oversight of different types of economic and social activities.

To avoid being trapped in a network of double constraints that would inhibit decision-making, **a trade-off between the values underlying choices and the prioritization of principles we collectively wish to be upheld must be made**, while avoiding focusing the debate solely on respect for privacy. In this exceptional situation, **assimilating data collected or used in managing pandemic risk with particularly sensitive data**, possibly placed through management agreements in the care of medical institutions, could offer satisfactory guarantees.

We believe the **principle of necessity** should be favoured: if the usefulness of an IT-based solution is deemed too low in view of its implementation conditions (for example, an application that would require, in order to be effective, voluntary and use by 60% of the population), it would be advisable either to temporarily change the conditions of its deployment or to change strategy by deploying a different technology.

While tracking the movements of potentially infected people is the usual way of managing epidemics and while one application may allow for its large-scale deployment, other approaches are emerging, such as the **use of predictive**

**models of pandemic evolution which make it possible to identify places and situations at risk**. Here again, ethical risks exist, such as seeing certain neighbourhoods or populations (often already vulnerable or marginalized) stigmatized, but they must be put into perspective in terms of the solution's effectiveness in preserving public health. Thus, the debate cannot focus on the implementation modalities of a solution without reflecting on the appropriateness of the solution.

The implementation of measures allowing for medium-term management is a challenge in societies that have developed a strong aversion to risk. It requires careful support from public authorities. **This support concerns, first of all, the management and sharing of responsibility**: the individual cannot be held solely responsible, which could lead to the stigmatization of infected people. However, responsibility cannot be borne solely by the collective, which could result in a lack of accountability among the least vulnerable people, at the expense of social justice.

**Any effective solution therefore requires solidarity among committed citizens**. This assumes the following:

- The **role of the state as coordinator** in determining public health priorities (for example, whether to open up sectors of the economy, and in determining the characteristics of IT-based solutions and the type of data collected), and in promoting standards that facilitate national and international interoperability of digital devices. In particular, business leaders, cannot be solely responsible for deciding on deconfinement or operations management measures in the event of a health crisis (prior to the mass distribution of a vaccine), in the midst of a social dialogue that might become

tense. The state will also have to define the adjustments for minimizing the discriminatory effects or harm suffered by certain categories of the population as a result of the use of such measures, for example, by introducing public policies to compensate for loss of income of persons or communities that declare they are infected.

- The role of standards bodies or independent multidisciplinary advisory groups in assessing the potential technologies and developing standards that consolidate all best practices for the responsible development and deployment of these new technologies and **facilitating their national and international interoperability.**
- The **role of the private sector** in the ethical and responsible development and deployment of these technologies and in the overall measures taken to ensure the health of employees and customers, as well as the responsible reopening of the economy.
- The **management role of communities** (municipalities, intermediary bodies, neighbourhood associations, school boards...) in the local application of measures, adapting them as much as possible to the realities on the ground and encouraging buy-in by the public.
- The **role of each citizen** in adopting measures that are sometimes very restrictive, but which can effectively combat the pandemic — which requires individual, collective and equitable responsibility across all stakeholders — and the desire of the vast majority of citizens to avoid catching the virus and infecting their loved ones.

**The governance of the selected technological solutions therefore appears to be the key factor conditioning their success or failure** and must reflect the management of the responsibilities mentioned above. To do so, an appropriate body must be created, which must be:

- **Multipartite:** In addition to members of parliament and the government, who guarantee legitimate regional and national representation, as well as experts, the specific body for governance and control of IT-based solution deployment must also include representatives of civil society and intermediary bodies, capable of inspiring citizen trust and commitment.
- **Agile:** As the situation and knowledge of the virus and how it spreads evolve, the chosen solution will have to be adapted in successive iterations.
- **Transparent and reasoned:** In periodic assessments and possible adjustments to potential solutions, the reasoning process and rationale (or evidence) used must be explained and supported transparently and understandably. This is crucial for stakeholder confidence in the choices made.
- **Temporary:** If the risk of pandemic persists, the evolving and iterative nature of the proposed solutions should allow for their impact to be reduced and then discontinued as required, under the direct control of the governance body.



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