Vulnerability in Technological Cultures

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Wiebe E. Bijker

We live in vulnerable worlds. As individuals we run the risk of being mugged in the dark alleys of Maastricht. Our material world may be threatened by floods, earthquakes, or airplane crashes—depending on where we are. Our social institutions such as family or church may be eroded by individualisation. And our culture, some argue, is being attacked by McDonald's and other immigrants.

How to understand these vulnerabilities? What use could it be to lump these very different forms of vulnerability together and study them within one framework? Why study them at all?

I will argue that studying vulnerability is fruitful for both scientific and political purposes. It yields an important broadening of the research agenda as compared to a mere focus on risks. And a focus on vulnerability allows for new approaches to social problems and thus will have effects on the political agenda too.

When we say that a system is vulnerable, we typically want to say that it is susceptible to harm. Vulnerability thus is a property or characteristic of systems, or a society, or a culture. The related concept of risk is differently applied: risk is about events, and it includes a notion of chance.

Three points I want to make about the concept of vulnerability. The first is that vulnerability typically exists in a technological culture. Second, that vulnerability is not simply and exclusively negative. My final point is that vulnerability asks for research that engages with the outside world—problem-based research—with the interdisciplinary character that Maastricht University is known to deliver.

All cultures are vulnerable. Bangladesh is vulnerable for sea-level rise, and Eskimo culture is vulnerable for the multiple effects of climate change. Often the modernist assumption is that technology will make cultures less vulnerable: use dikes to keep Bangladesh dry; provide modern forms of livelihood for the Inuit. My first point will be that this is only half of the story.

Our culture is a technological culture. Today's societies are thoroughly technological, and all technologies are pervasively cultural. Technologies do not merely assist us in our everyday lives; they are also powerful forces acting to reshape human activities and their meanings. When in medical practice a sophisticated new technique or instrument is adopted, it transforms not only what doctors do, but also the way patients, nurses, doctors think about health, illness and medical care—it transforms the culture of that particular medical life-world.

So, cultures are technological cultures because technology plays a crucial role in constituting them. However, technology does not only support and strengthen the structures of societies. The high-tech character of modern societies makes these structures vulnerable at the same time. If you are not part of the globalised financial system, you do not suffer when the mortgage market at the other side of the world drops into crisis. If there are no airplanes, terrorists cannot steer them into high-rise buildings. If you do not have dikes, they cannot break. And it is even worse: technologies do not only make accidents possible—they ask for it. Once you have large technological systems, accidents are inevitable. Accidents, Charles Perrow argued, are 'normal' in complex and tightly knit technological systems. To sum up: all cultures are vulnerable, and technological cultures just as much so.

In previous research, summarized in the printed version of this lecture, I have illustrated this with an analysis of the different forms of vulnerability to flooding in New Orleans and in the Netherlands. How is it possible that America failed to keep dry feet in New Orleans, when large parts of the Netherlands can exist below sea level? Does this suggest that the US Corps of Engineers is less capable than the Rijkswaterstaat engineers in the Netherlands? I showed that something else is going on: the difference is not one of expertise, competence or technical quality, but one of coping differently with vulnerability in different technological cultures. The culture in New Orleans is one of hazard mitigation: of predicting hurricanes, of evacuation plans, of insurance schemes. The Dutch culture is one of keeping the water out.

In this way I could explain the flooding of New Orleans and the dry feet of the Dutch by a difference in technological cultures rather than by a difference in engineering qualities. But there are more consequences than just a better understanding—there are implications for policy, for what to do in New Orleans. One conclusion must be, that importing Dutch technical solutions into New Orleans will not help by itself. Technologies that do not fit the technological culture typically do not function properly. Technologies ask for investments in money, space, people; technologies need to be maintained and managed; technologies need to be understood —at least to some extent—by the people that use them. Dutch technologies may help New Orleans, but only with a proper fit with the American technological culture. Without such fit, foreign technologies will be as effective as the proverbial refrigerator in a Sahara country without electricity.

To be vulnerable in the sense of being susceptible to breaking down, being destructed or dying is an unambiguously negative experience. But there is more to it. I will argue that vulnerability often is inevitable, and in some instances even can be positive.

Some vulnerability is the inevitable consequence of something else that we want because that is positive. The easiest examples are large technical systems. Many of us enjoy GPS systems for navigation, but these entail new and inevitable vulnerabilities—lack of battery power, lack of connectivity, maps that have not been updated, or plain technical failure.

There are also examples where vulnerability seems to be directly positive. In a small-scale irrigation system in Tanzania the dams were not made of concrete but of clay, because the clay dams require more maintenance. Maintaining the technical dams, it was argued, will also help to maintain the social cohesion in the village. The relative vulnerability of the clay dams is explicitly and strategically employed as something positive. In this example the crucial point is not about possible failure of the dam technology—that could be compensated for by just another technical back-up device—but about a different frame of mind: to see vulnerability as an opportunity to act, to learn and to innovate.

Similarly the vulnerability of the Dutch living below sea level can be argued to have had the positive effect of stimulating a more cohesive style of politics. If you

deem this 'Poldermodel' style of political-economic co-operation positive, as I do, then that is a positive effect of the vulnerability of the Netherlands.

But my claim reaches beyond Tanzanian clay dams and Dutch polders: I think that vulnerability can be considered a necessary condition for the survival of any society: only if a culture is capable of learning, innovating, and flexibly reacting to external threats, it will be sustainable in the long run. And that implies some degree of vulnerability. A culture needs to be flexible, and thus a bit vulnerable, in order to survive. Vulnerability in technological cultures is inevitable, and to some degree even positive. That was my second point.

I now want to answer the most dreaded question asked after any research paper: *so what?* My answer will come in three steps: the focus on vulnerability makes for a different agenda; it allows for new understanding; and it makes new forms of intervention possible. Or in other words: (1) you see a different world, (2) you understand the world differently, and (3) you can make a difference in the world.

First, I hope that the language of vulnerability will help to address questions of community, democracy, justice. The language of risk, with its tendency towards quantification, optimization and management seems less fit to deal with these broader issues. Vulnerability is, I have argued, part of *la condition humaine*, and especially part of the human condition in technological cultures. But the fact that vulnerability is inevitable, does not make us less responsible for dealing with it, shaping a just and democratic society around it.

To illustrate how an analysis of vulnerability opens up for questions of justice, I will turn to yet another example—the Muslim minority in Gujarat, India. The vulnerability of Muslims in the state of Gujarat is partly caused by their condition of being a minority in a Hindu state, and partly by the high-tech economic development that the current Hindu government is pushing through. This government pursues the creation of a new technological culture that is very different from the plural, syncretic culture of the old Gujarat in which Muslims and Hindus lived well together as neighbours. The new state vision projects a global Gujarat of special economic zones, science cities, high-tech infrastructures—and Hindu identity. It seeks an erasure of the old history with its trades and crafts, its memories and its identities. But with the

erasure of memory, new vulnerability is created. *You need memory to have an identity; you need identity to recognize your vulnerability; you need to appreciate your vulnerability to cope with it.* It is precisely their memories that Muslims in Gujarat are asked to abandon. They are asked to give up the right to their own story, their identity, their participation in the new technological order. The Gujarat state policies thus breed specific vulnerabilities that may result in a broader break-down of society. The consequences are not just for the Muslims, but also for the Hindus who now face counter violence, including terrorist attacks.

The vulnerability of the Muslims, adivasi and dalits in Gujarat may seem different from the other kinds of vulnerability I have been talking about. But it is not. The violence that creates this kind of vulnerability in modern India is inextricably connected to the use of science and technology. Whether it is the chain of modern research institutions in the Gandhinagar-Ahmedabad corridor, or the push from the green to the gene-revolution, or the almost religious belief in an Indian nuclear programme—these only make sense as part of a technological culture. And these technologies do not diminish vulnerability—they only shift and redistribute vulnerabilities. The Gujarat policies have inescapable effects on all groups in society, by shifting the brunt of vulnerability to the weak. Muslims were killed and raped with the technologies of state bureaucracy and mobile phones; they are now excluded from democratic participation in economic and technological progress.

So, that was about seeing the world differently: making an agenda for justice, community and democracy in technological cultures. Now about understanding the world.

My colleague Jessica Mesman studied the vulnerability of newborn babies in neonatology intensive care units (NICU). As an anthropologist (and a nurse) she spent several years observing the NICU doctors, nurses, children and parents. Her project turned the standard way of looking at patient safety upside-down. This standard way is to prevent accidents by detecting and eliminating causes of error. To do so, protocols and safety devices are developed. Mesman looked beyond this deficit-model of safety (that is: safety as the lack of error), and studied the texture of the safety itself, including its informal and unarticulated dimensions. Patient safety, she showed, is also realized by unplanned actions, hidden competences of doctors and nurses, and informal social structures in the NICU. There is a mixture of styles of reasoning and

acting: a rational-scientific style and a care- and experience-based style. Here is one insight from Science-Technology-and-Society studies (STS): diversity is better. Often messiness is taken to generate vulnerability; it is also diversity that helps to keep vulnerability at bay.

The neonatology people liked her book. Why? Did my colleague tell them anything they did not already know? Yes and No. *NO*: Mesman only reproduced what the NICU inhabitants had told her. But *YES*: she retold what she saw in her STS language, and that was new to them. Her book holds up a mirror to the neonatologist. And like all mirrors, the STS mirror does not simply reproduce, it is not innocent: the STS mirror highlights certain observations and adds interpretation, theory, explanation.

Holding up the STS mirror offers new ways of understanding the world. But how about changing it?

The Maastricht University hospital asked this STS researcher to join a committee to improve neonatology safety. This is more than holding up a mirror. This is engaging and making dirty hands. Here we need a new metaphor. What we see here is the *STS Kiss* in an enactment of the Sleeping Beauty fairytale. Like in the case of the mirror metaphor, all the knowledge and beauty is in the world (sleeping Princess) studied by the STS anthropologist (the Prince). But after kissing her awake and making here aware of her own knowledge and skills, the Prince does not turn away, but engages with the world—even marries the Princess. To say that the STS researcher is now making dirty hands, would be an unfortunate mix-up of metaphors with the beautiful and clean princess, but I trust that you are getting the message.

But marriage is risky. Intervening in the world is more risky than merely studying it. Collaboration between scholars and practitioners is not easy, the goal is not pre-set, and the rules of the game need to be invented on the move. The Prince needs to be prepared for a slap in the face from the Princess, before she gives him the time of day. But there is no way back: once the Princess is kissed awake and the Prince has ducked her slap—problem-based research is happening and engaged studies of vulnerability will make a difference. New alliances between academics and practitioners—in India and in Holland, in the global South and global North—will study ánd celebrate vulnerabilities. Our worlds are vulnerable in their core. Once we

recognize that, we will be better capable of coping with, and in some instances even benefiting from the vulnerability in our technological cultures.