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Technology's Impact on our Ethical Responsibilities of Critical Infrastructure and Capabilities

Technology's impact on modern society and infrastructure has developed new responsibilities that cybersecurity professionals and creators of new technologies will have to keep in mind as we continue the growth of our capabilities as humans. Now the responsibility of our actions in relation to technology has moved to an interpersonal and indirect level as more unintended consequences rise from near-sighted and less knowledgeable actions. Now, the increased intelligence of devices blur the lines between subject and object allowing for objects to become mediums for social interactions. Because these social interactions are more dependent on the objects, the objects influence our perspectives on our interactions and view of the world around us. As these foundations begin to evolve, we must consider the implications our new world has on critical infrastructure. One of the most important responsibilities that we have to take part in is protecting, maintaining and developing our critical infrastructure. These changes mean that we need to become more mindful in our governing of the things that will continue our growth as a society and as human beings.

The Responsibilities of Control

Earlier models of responsibility ethics contend that responsibility is an individualistic and direct effect relationship with the actor (cause) and effects. The modern responsibility of our actions in relation to technology has moved to an interpersonal and indirect level as more unintended consequences rise from near-sighted and less knowledgeable actions relating to tech development. The purpose of technology for me and the rest of us is to become better at the things we need to do. Jonas mentions the relationship between functional necessity and success in his article, *Technology and Responsibility: Reflections on the New Task of Ethics* (Jonas, 1973). As our needs for increased functionality achieves success for the things we need to do, there's a following trend of unintended consequences. We begin to neglect the nature of our world is one that is based on the concept of give and take. It's a natural cycle of cause and effect. As our technological capabilities increase, so do the things that we need to protect and make sure are still sustainable. Protected and sustained on several levels like natural environments, as well as personal, social, economic, and political levels. Ever since society has learned how to industrialize and use fossil fuels for energy, it has and still is giving us energy for transportation, heating, cooking, and so much more. This is a functional necessity for a new form of energy being met with success. However, pollution to our natural environments also has and still is occurring as an unintended consequence. This is a reflection of my earlier mention of this natural

cycle of cause and effect in relation to technology. The scenario also speaks to how multiple investors, political officials, and anyone who took part in servicing this form of energy (interpersonal) played a part in giving us these aftereffects (indirect effects). These aftereffects are the responsibilities that we've manufactured for ourselves as our control over the natural world through technology gives us more capabilities.

Regulating Technology in the Face of a New Responsibilities

The Enlightenment's view on our relationship with objects has become flipped. Before, subjects (us) were meant to influence and manage objects. Now, the ambient and complex intelligence of devices blur the lines between subject and object allowing for objects to influence our and manage our interactions with society, the world and our privacy. Because these social interactions are more dependent on the objects, it is no longer that subjects manipulate the objects. Instead, it's the other way around. Peter-Paul Verbeek mentions examples of this phenomena in his article, *Designing the Public Sphere: Information Technologies and the Politics of Mediation*:

“Under the name of ‘persuasive technologies’, products and systems are being developed to persuade people to behave in specific ways. School toilets can detect if children have washed their hands when they leave, and urge them to do so when they forget. Smart mirrors in the waiting room of medical doctors can recognize one’s face, and morph it into an image of what you will look like in 10 years... Smart windows in shops can determine the direction of one’s gaze and give extra lighting to articles that seem to interest specific people” (Verbeek, pg.220).

Verbeek goes on to explain that it's futile to deny complete use of technologies in the name of regulation because we are already in this age. The functional necessities and attainment of them establish their place in our society, despite or in favor of institutional/societal perspectives. Our attainment of capability means that the technology that we develop is here to stay in one way or another. Instead, we should adapt to the changed environment that we inhabit. Rather than denying total use of technologies that can be considered harmful in one way or another, we should develop regulations that determine which contexts these technologies would be most appropriate in so that we can achieve our functional necessities and still keep in mind the aftereffects of our interactions with technology. Alongside developing standardized ethics for appropriate situations in which we can use certain technologies, we can also prepare for when these standards aren't always followed. We are able to do this because attempting to handle regulation from an internal view of the world we inhabit allows us to realistically plan ahead for all kinds of threat actors that negatively impact our critical infrastructure. An external exclusive view of the world that technology has already influenced does not give us this capability.

Responsibilities and Critical Infrastructure

One of the most important responsibilities that we have to take part in is protecting, maintaining and developing our critical infrastructure. This responsibility is a task that will never end and only become more complex. Our management of it needs to reflect these traits. While we apply developed tech to our critical infrastructure to meet our functional necessities, the responsibilities that I've mentioned before will also develop. An example of this relationship between developing critical infrastructure and responsibilities can be found in our SCADA systems. A security issue with SCADA systems is that there's a risk of "unauthorized access to software, be it human access or intentionally induced changes, virus infections, or other problems that can affect the control host machine" (<http://www.scadasystems.net>). As our software develops to better interact with the various parts of SCADA systems, from PLCs to HMI units, so does our responsibility to implement better cybersecurity practices. As we gain more benefits from the progress we make in technology, so do the malicious threat actors that attempt to exploit said technology. It is important that we not only develop our critical infrastructures but also focus on maintaining and protecting them in the face of new ethical responsibilities.

Learning, Adapting and Preserving

To respond to the increase in responsibilities, we need to continue to ask ourselves and other professionals from various fields and backgrounds about how innovating technologies could positively and negatively impact society. As we learn more about the technology we develop, we can respond and regulate in a more effective and sustainable manner. We need to adapt to the new circumstances of our relationship with technology and our interactions with the world in terms of regulation. Not to exclude technologies, but to create standards of use that include contextualized situations that we would use them in. It is important that we meet developmental achievements of critical infrastructures with a proportional amount of investment in protecting and maintaining them in the face of new ethical responsibilities that we have as owners of these technologies and as cybersecurity professionals.

References:

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