

# Seventeen Questions for Technologists to Build a Better World

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## 1 WHO SHOULD BE RESPONSIBLE?

Computing technologies today mediate most spheres of society - economics, politics, and culture. Computer assisted industrial automation in the 1970s [1], platformization of work in the last decade, and now the prospects of AI-shaped futures of work, have changed labour economics. Surveillance technologies, digital identity systems [2], and the direct use of social media platforms by politicians and governments [3] have transformed the citizen-state interface by putting more power in the hands of the state to control and influence citizens. Information filtering algorithms on social media platforms have similarly disrupted socio-cultural processes of deliberation and learning through communication [4]. Naturally therefore calls for exercising greater responsibility and forethought by computing technologists - the designers, engineers, researchers, and managers involved in the digital technology sector - may seem valid. Is it justified though to thrust responsibility on the technologists, instead of relying on alternative mechanisms such as regulation by governments or informed choices made by consumers?

Traditionally, it seems that technologies have been governed by society rather than by technologists. Irrigation systems such as canal networks or water use from storage tanks and similarly other common pool resources have been regulated for efficient and equitable access through democratic mechanisms evolved by local communities [5]. Technology infrastructures in wider use at large scales such as road networks for automobiles were made safer through traffic lights and regulations on the use of seat belts, brought in by governments [6]. In all such cases, the working of technologies being governed was understood by the people and policies were evolved based on this understanding to impose their social control over the technologies. And the underlying values considered important by society were reflected in these policies - equity, safety, efficiency, etc. Similar efforts have been made even in the digital realm with regulations such as GDPR to preserve values like privacy, and by falling back upon basic constitutional rights such as non-discrimination to have them reflected in technology practices.

Regulations have however been slow to react to rapid technology development and deployment. This may be due to both a limited capacity of the state to keep up with innovations that arise in the private sector, or due to a complicity between the two, as was significantly observed with the rise of surveillance technologies post 9/11 [7]. This is when it seems that the surveillance incentives of both the private sector and the state coincided, much like how the cold war was used as an excuse to accelerate automation and squash labour activism [1]. Further, even when efforts are undertaken reactively, they may be incomplete - GDPR is a case in point to keep in check data-using organizations but many stated requirements by law may actually not be auditable and violations may not be enforceable [8]. The ability of regulation by society to enforce

widely accepted values, be it at a local level or at national levels through systems like representative democracies, therefore seems limited when the technologies are hard for people to understand and govern through simple rules, or when individual or economic-cultural-political incentives of power holders deviate from societal values.

Having consumers demand more ethical outcomes from the use of technologies is also hard, even with an alert civil society [9]. This is because consumer preferences are often manipulated by advertising and also shaped by the dominant capitalist ideology of individualization which draws emphasis to narrow values like efficiency and cost than to societal values like fairness and rights. Further, consumer preferences and societal values may not always coincide - paid technologies may be out of reach for all citizens, and would therefore tend to reflect the preferences of consumers rather than of citizens in general. Societal values may also be hard to translate into action when people's understanding is low about how complex technologies work and affect change.

Since the ability of regulations or consumer ethics to govern digital technologies are blunted for the reasons stated above, the weight of responsibility cannot be completely shifted away from the shoulders of technologists. Technologists cannot entirely out-source their responsibility to other stakeholders. This brings up the follow-up question: how should technologists go about ensuring that responsible outcomes arise from their innovations?

## 2 BEING RESPONSIBLE

In my book, *Technology and (Dis)Empowerment: A Call to Technologists* [10], and also as argued by several colleagues independently [11, 12], we call out the limits of addressing ethics through the technology design itself. Technocratic approaches to address the fallouts from technology, such as by eliminating dark patterns from the user interface, coding fairness constraints in algorithms, detecting and removing biases in the data used to train machine learning algorithms, incorporating privacy enhancing methods in storage and use of the data, etc. are not complete in themselves. Fallouts, rather, often arise at the socio-technical interface when new situations that will inevitably surface given the complexity of our world are not successfully handled by pre-designed technology. Issues seen with failures of algorithmic content moderation on social media platforms, or the need for dispute resolution procedures to appeal against algorithmic decisions, are examples of such problems at the socio-technical interface that arise despite careful technology design. These require careful management practices to evolve policies or to re-design the technology [13]. At this socio-technical interface, power relationships between different stakeholders who interact directly or indirectly with the technology can also be transformed by the introduction of the technology - many of these changes too are hard to anticipate and may reproduce

power-based inequalities if they are not managed well [10]. Exclusion of marginalized groups from being able to access technology due to income constraints, or the introduction of intermediaries to help citizens interface with the state through technology mediated platforms, are known to reinforce prevailing inequalities. Given these limits of techno-solutionist approaches to fix problems with digital technologies, and the need to closely observe and manage emergent issues with technology use, what work practices should technologists embrace to avoid undesirable outcomes from technology?

It is important to realize that at heart the problem to be solved here is for technologists to serve as conduits through which values and goals considered important by society can be translated into technology design and its management. Actively upholding societal values can provide the necessary guardrails and help technologists steer the technologies towards societal goals. For this, first, technologists need an understanding of the economic-political-cultural context of the users who will use their technologies, and collaboratively formulate the values and goals that should guide the technology design. Second, as deviations happen, technologists need tools to listen to user feedback and evolve methods to continuously keep aligning and re-aligning technology projects closer to societal values and goals<sup>1</sup>. Third, technologists need the ability to translate these methods into action within their organizations. These points imply that technologists must not seal themselves in ivory towers and work off simplistic models of the world or values and goals which they consider as important. They must interact with the users, directly or through public spheres established specifically for this process<sup>2</sup>, and both learn from them and help them understand the technologies. Such participatory processes grounded in action-research can serve to translate the values and goals considered important by society into the design and management of technologies. Further, technologists must resist the capitalist and neoliberal ideology which creates constraints within organizations and deflects attention from doing anything that does not lead to greater profit or market share - ethics as such has little value in these systems. These pathways lead to the following questions that can be posed to technologists, to serve as a means of both reflection and praxis through a workers' inquiry approach [16]:

- How does your work ultimately enable different applications, services, and products that people use?

<sup>1</sup>I separately discuss what these societal values and goals should be, and argue that technologies should be built with a singular objective to remove unjust societal structures that reproduce inequality. For society to arrive at this objective, I also emphasize on the need for a pluralistic public sphere to have society learn about inequities and injustices faced by different social groups, and thus collectively converge to this goal of removing hegemonic structures of power [10].

<sup>2</sup>Gram Vaani, a social enterprise co-founded by me, has run several campaigns on its voice-based participatory media platforms to understand fallouts from the use of digital technologies by rural populations. One such study examined the government's digital backbone to execute direct cash transfers of social protection benefits to rural citizens, and identified common problems that occur at different stages of the transfer process [14]. Another study examined digital financial services such as peer to peer payments and electronic banking, and uncovered cases of fraud and knowledge gaps that rural citizens have faced [15]. These insights were communicated to government departments and several financial services providers, respectively, thus having Gram Vaani's participatory media platforms serve the role of public spheres to enable service providers to interact with the users of their services. Not only was the feedback useful for the service providers, airing citizen concerns on a public sphere also nudged the providers to promptly respond and rectify the issues.

- Is there a way for you to interact with these users? Or are there other ways for you to understand how users are affected by the products resulting from your innovations?
- Are the outcomes positive for some people and negative for others?
- If you do not like some of these negative outcomes, does it bother you that your work is leading to outcomes that you do not agree with?
- Is it possible for you to change anything in your work to ensure that more desirable outcomes arise? Or for your team to change its ways and membership so that it can pay better attention to these negative fallouts? Or for your organization to adopt new practices internally, or advocate to customers and vendors upstream or downstream in its production value chain to bring changes at their end?
- Are there others in your organization who agree with your viewpoints?
- Do you and like-minded colleagues have pathways available in your organization to put across your viewpoints?
- Would these be heard and acted upon by the management?
- If they would be opposed or dismissed, explicitly or through inaction, do you understand the broader political economy to be able to reason why?
- Could the organization's management have brought about the changes but did not, or were their hands tied because of wider economic and governance systems in the world that would impact competitiveness or finances?
- If appropriate action was feasible but still not taken, can you think of ways to have more power in organizational governance and decision making to ensure that meaningful action is taken in the future? Can it be done through enforcement of intellectual property rights to define purpose specifications for which the output of your labour can be used? Can participation in organizational governance be gained through collectivization with your colleagues?
- If appropriate action was not feasible because of imperatives imposed by the wider systems of the state and markets, would you like these systems to run differently?
- Do you think you can affect such change in a democracy? Are there social movements in your country or around the world that you are aware of, which are pushing for similar changes?
- Would you lend your support to these movements by collaborating with them to propose new regulatory structures and laws, or by building alternate systems and ecosystems, or by monitoring existing systems for greater accountability?
- Do you think there is recognition in the wider society of the need for these changes, so that there is hope in democratic setups that laws and regulations can arise for organizations to take more responsibility or for governments to create better policies?
- If not, do you think you can change that by building greater engagement with users to make them more aware, or by collaborating with them in campaigns for change where you can make strong contributions because of your deep technical knowledge about alternative design elements and management practices that can be built?

- Or do you feel that it is not your job to engage in campaigns? If so, what would you suggest should be done to ensure that desirable outcomes arise from technology?

Marxist humanism presents an argument on why technologists should undertake such steps to ensure that responsible outcomes arise from their technologies [17]. Marx saw society as shaped by social relationships created through production-consumption relations [18]. Positive social relationships are those that create genuine use-value for the consumers through production processes that are not coercive for the producers and do not involve any instrumental use of others. Deviations which create negative social relationships result in alienation - when workers lose control over the labour process or the outcomes arising from their labour. Humanism is to avoid conditions that create alienation. Technologists are workers producing technologies for society through their labour, and for their own humanism they should push the world towards avoiding technologies and workspaces that may harm others, especially the weak, by adopting new paradigms of technology design and management that can lead to a better world [10].

### 3 A BETTER WORLD

It is indeed heartening to see co-determination movements led by technologists to demand a say in the working of their companies [19–21], collectivize and build unions [22], move towards appropriate technology philosophies of building technologies that can be easily understood and managed by the users [23], choose ethical source licenses [24], and even incorporate political philosophies to favour cooperatives over capitalist companies [25], free and open-source systems over proprietary technologies [26], and counter-surveillance and privacy enhancing solutions over legibility-enhancing and tracking systems [27]. The future that may arise if technologists are indeed successful in efforts to reshape existing technology design and management paradigms, is a world of technologies that can be understood and controlled by their users, not designed and managed by large companies but by a digital commons or democratic coalition of local institutions of people, who have the required skillsets and knowledge to build and operate the technologies, with technologists not being external stakeholders but a part of the community itself, taking responsibility to steer the technologies away from harmful outcomes, by following participatory practices of design and management, with constructive debates to define societal values - values of cooperation and collectivism instead of competition and individualization, of power-based equality instead of control and domination, of pluralism instead of closed echo chambers - and to use technology only towards these values and goals.

Such a future will imply that all stakeholders – technologists, citizens, and consumers – are aligned in their values at a societal level and committed towards social good.

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