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The Risk of Ethicalisation in Ethical Engagement with Quantum Technologies: Some Brief Considerations

Clare Shelley-Egan

Abstract 'Quantum for good' is slowly beginning to emerge as an ambition for quantum technology development. As the ambition begins to percolate down through policy and scientific communities, questions as to what 'quantum for good' means and how it might be operationalised will arise. Fora for discussion will spring up and, at the individual level, actors will be faced with how to respond to the call for 'quantum for good'. What might 'quantum for good' mean in practice, how can 'good' be defined, by whom, etc.? ELSA communities are likely to be involved in these discussions. This contribution warns ELSA scholars of the risks of 'ethicalisation' in pondering these questions with respect to two issues: 1) the nature and framing of ethical discussion in new and emerging science and technologies; and 2) reliance on ethics and ethical expertise. Ethicalisation can lead to a hollowing out of ethical concerns through a downplaying of interests, stakes, and, ultimately, politics. The article offers some suggestions for a 're-politicisation' of ethics within the context of engagement with quantum technology.

Keywords Quantum ethics · 'quantum for good' · Ethicalisation · Depoliticisation

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Introduction

Quantum technologies comprise a set of emerging technologies that make use of quantum phenomena and are differentiated along three different areas, namely quantum computing, quantum communication and quantum sensing. This process of emergence tends to be referred to as the second quantum revolution. Notwithstanding low technology readiness levels and only a few applications breaking through, momentum is steadily building around quantum technology development. As of August 2023, at least 32 countries had developed a national quantum initiative or strategy ([1], p.1). 2025 has been named by UNESCO as the International Year of Quantum Science and Technology.[1]

Discussions about ethics of quantum technologies are slowly taking off, primarily within scholarly communities engaged in ELSA (Ethical, Legal and Social Aspects) and Responsible Innovation studies [2, 3]. While some discussion of ethical issues relates concretely to applications such as quantum computing and its anticipated effects on encryption [4], other discussions rest on broader issues such as access to quantum technologies [5] and concerns about the monopolisation of quantum technology development by profit-driven actors [2]. Furthermore, a 'quantum race' narrative has emerged, reflecting a pervasive sense of international conflict and competition that is a key driver for innovators and investors [2]. Against

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[1] https://quantum2025.org/.

this backdrop, 'quantum for good' is slowly beginning to emerge as an ambition for quantum technology development. For instance, the World Economic Forum highlights the importance of orienting the governance of quantum computing towards the 'benefit of humanity' [6]. At national level, the Dutch quantum innovation system emphasises 'quantum for good' as a key driver [7]. At a conceptual level, 'quantum for good' can be viewed as a signifier (or container) for a certain direction of technology development. 'Quantum for good' can be likened to 'Tech for Good' as a notion that emphasises the development or deployment of technology for the common good [8]. It can also be compared to the notion of 'responsible development' of technology, such as nanotechnology. While the drivers for both differ,[2] both labels point to a desirable world that can be pursued through progress in technology development. Moreover, both labels highlight the importance of the context of application or the kind of 'use' first applications will offer our societies [7].

As the notion and ambition of 'quantum for good' begins to percolate down through and around policy environments and scientific communities, questions as to what the notion means and how it might be operationalised will arise. Fora for discussion will spring up and actors working within quantum science and industry communities will engage with the notion, through policy requirements or other initiatives. At the individual level, actors will be faced with how to respond to the call for 'quantum for good'. Quantum scientists and business-to-business (B2B) actors are especially relevant here. A large share of future second generation QT applications are expected to be targeted at scientists and innovators as users of QT applications in various areas [2]. This suggests that both B2B actors and scientists will be key actors in driving quantum technology development, while having opportunities to influence and shape responsible uses. As regards responses to prescriptions for 'quantum for good', one can imagine two scenarios

(cf. [9]). In one scenario, B2B actors and scientists might engage themselves in developing their own ethical guidelines and codes of conduct for quantum technology development in the name of 'the good', as has occurred in AI-related sectors [10]. In a second scenario, developers of quantum technology may seek professional input from social scientists and humanists enrolled in the service of ELSA work, perhaps in larger quantum technological programmes [9].

As an ELSA scholar engaged in a quantum innovation system, it is the second scenario I address here. How, concretely, can ELSA scholars equip themselves to engage with the push for 'quantum for good'? Questions here include: What might 'quantum for good' mean in practice, how can 'good' be defined, by whom, etc.? Rather than take an applied ethics or philosophical viewpoint on these questions, I instead address questions of a more meta-ethical nature [11]. Thus my interest is not in substantial questions about good action and a good life but in how the framing and discussion of 'ethics' takes place in the first instance. In this brief discussion note, I argue that those of us in the responsible innovation of quantum/ELSA (Ethical, Legal and Societal Aspects) communities must be wary of the dangers of 'ethicalisation'. Ethicalisation can lead to a narrowing and 'de-politicalisation' of the ethical questions at play in emerging technologies, and to a co-optation of ELSA researchers in this de-politicisation. I argue for a 're-politicisation' of ethics and briefly sketch out what this might entail for ethical engagement in quantum technology. My argument is founded on lessons identified from other new and emerging science and technology (NEST) discourses, and especially, the nano-ethics discourse. The nano-ethics discourse and the drive for 'responsible development' of nanotechnology are of particular relevance as nanotechnology is a paradigmatic case for ethics of NEST.

Before proceeding, I briefly define what I mean by 'politicisation' and 'de-politicisation'. I adapt Hartley et al.'s [12] positive notion of politicisation – in relation to 'responsible research and innovation' as a research governance tool—as being about the opening up of scientific research through pluralising expertise and exposing it to a broader range of voices and values. Here, the politicisation of ethics is also aspirational in meaning, referring to an opening up of the terms of ethical debate to scrutiny with respect to the framing of issues and the positions and stakes

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[2] Although the notion of 'tech for good' is poorly defined, it has been positioned as coming out of both public *and* private sectors, while 'responsible development' of nanotechnologies emerged – to a significant extent—from specific public political and institutional contexts both in the European Union (EU) and the United States (US), e.g. adaptation of regulatory requirements to account for nanomaterials in the EU.

of involved actors in debate. Conversely, 'de-politicisation' would imply a dampening of such aspirations through the denial or deliberate obfuscation of such conditions of ethical debate.

Ethicalisation[3] of Technology and Society

An 'ethicalisation' of technology and society has been diagnosed as being particularly prominent in relation to emerging technologies [13, 14]. Hedlund [14], for example, defines 'ethicisation' as follows: it "refers to how technological and other issues are commonly framed as ethical, and how ethics is perceived to be a tool to resolve conflicts of interest, dilemmas or controversies" (p. 2). For Ferrari and Nordmann [13], 'ethicalisation' occurs when "issues of technological development are translated into questions of ethics [and] they appear to open up to a broad audience, allowing a multitude of considerations to be brought in" (p. 52). However, such issues tend to lose their political character and move into poorly defined fora such as ethics committees and citizen panels, where subsequent findings are open to interpretation and an unclear uptake in policy-making.

Indeed, a turn to ethics may not always be reflective of a sincere intent to embrace ethics as a normative endeavour. Rather ethics is often also tied up with strategic attempts to obtain acceptance for NEST and to advance technological development. In this sense, ethics can be said to become an 'ethics of progress' [11]. An ethics of progress centres on progress through new technology, with actors using qualifiers such as 'ethical' and 'unethical' to indicate what is good (should be done) and bad (should not be done). Such an emphasis omits the specific characteristics – and ethics- of the technology at hand, while more aspirational approaches such as ethics of technology development for human flourishing, for example, are sidelined. Furthermore, certain framings and thinking on ethics can serve to depoliticise questions and choices around science and technology. For instance, scholars working in the area of ethics for Artificial Intelligence (AI) have observed a particular ethical 'frame' that prioritises technical solutions [15, 16]. This frame reflects a 'recourse to the technical' [17] and has the effect of creating a division between science and technology and ethics, while specifying the responsibility of the scientists or technology developer as being solely about the technical.

In the following, I home in on two different strands of ethicalisation, namely 1) the nature and framing of ethical discussion in NEST; and 2) reliance on ethics and ethical expertise. I address these two issues in a somewhat integrated fashion, given my interest in ethical engagement in NEST as an ELSA researcher. I describe how ethicalisation can lead to a hollowing out of ethical concerns through a downplaying of interests, stakes, and, ultimately, politics.[4] I offer some suggestions for a 're-politicisation' of ethics within the context of engagement with quantum technology.

Ethics as a Lingua Franca

I begin by using a critical framing of ethics as a 'lingua franca', a term that was coined within the context of debate on the responsible development of nanotechnology. Key scholars at the time criticised the conversational mode which they argued the notion of 'responsible development' had adopted [18]. Ethics was part of this conversational mode, described as becoming a *lingua franca* that functioned to bring stakeholders together, rather than facilitating the discovery of ethical concerns [19]:

> Ethics has become a kind of lingua franca for everyone who engages with nanotechnologies. When many different stakeholders come together to talk about promises and expectations, policy and funding priorities, opportunities and risks, regulation and voluntary codes, hopes and fears, foresight and governance of nanotechnologies, their shared language revolves around public concerns, ethical issues, and common values like safety, well-being, transparency, accountability and trust (p. 46)

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[3] The ideas underpinning 'ethicalisation' are also subsumed under the notion of 'ethicisation'. In this contribution, I use the term 'ethicalisation'.

[4] Ethics of new technologies includes a political component, particularly if it concerns itself with orienting new technologies for the betterment of humanity, requiring purpose and intent as regards values, public interest, and so on.

The authors [20] contend that, on a "shared platform of ethics" (p. 172), stakeholders became attuned to each other and could engage in the open-ended exchange of issues and concerns. Stakes were downplayed and conflictual situations smoothed out. Two key features of ethics in this conversational mode were observed. The first was a consequentialist framing which reduced questions of ethics to risk–benefit analyses. Key ethical issues were then viewed as a matter of willingness—or unwillingness – to accept these risks [20]. A second feature of this conversational mode was visible in the notion of a 'win–win situation' whereby rhetoric about the technology revolved only around opportunities and benefits, with any adverse effects or challenges omitted from discourse. Such a win–win situation, in turn, obscured consideration of who might lose out or carry a disproportionate burden of the risk. This was due, in large part, to an absence of acknowledged stakes; stakeholders in a public forum on nanotechnologies, e.g. scientists and representatives of industry were "(…) supposed to act as individuals with opinions and concerns and not as advocates for powerful interests" [20] (p. 180). This mode of doing and discussing ethics emphasised ethics as an endpoint and as something to be solved, rather than a process of struggle, discovery and learning.

Under-and Over- Reliance on Ethics and Ethical Expertise

Ethicalisation can also imply an increased use of ethics expertise, which, in turn, may lead to an under- and over-reliance on ethics expertise. Hedlund [14] discusses this in terms of ethics for policy-making but the notion can be readily transferred to ethics and ELSA components of large research programmes.

Hedlund defines under-reliance as follows:

> (…) the risk that ethics advice is asked for, but for some reason is not listened to. Ignorance or resistance among those who are supposed to implement the ethics or lack of mechanisms of reinforcement can sometimes explain why ethics advice is not put into effect, but ethics may also be used strategically to get acceptance for controversial or sensitive activities and thereby run the risk of being perceived as something of an ethical alibi (p. 89)

In essence, under-reliance refers to a situation in which ethics advice is asked for but not taken into account. This under-reliance can manifest in various ways. Ethics may represent a symbolic use of expertise when questions of technology development meet resistance. Hedlund [14] offers the example of a turn to ethics in the case of bio-patents when issues of patenting parts of the body met with resistance. Similarly, ethics can be used symbolically to legitimate 'business as usual' or ongoing business. This is especially the case when ethics guidelines lack enforcement mechanisms.

Over-reliance on ethics expertise, on the other hand,

> (…) would occur when the fact that the ethical advice has been provided sends the message that the issue at hand is exhausted, with the risk that other urgent aspects will be overlooked (p.89)

This can occur when the development of ethics recommendations or guidelines gives the impression that the consideration of an issue has been exhausted.

If we translate these forms of reliance to a technological programme including an ELSA component, we can imagine a sort of expression of reliance on ethics expertise as follows: "We have included an ethics programme/work package, so we have shown that we care about ethics!" Indeed, ethicalisation appears in critical references to 'ELSIfication' [21]. The notion of 'ELSIfication' refers not only to the integration of ELSA into large technical programmes but can also be understood in a more derogatory sense, that is, in serving to "placate" research rather than informing the research process itself [21]. Thus, according to this argument, ELSA research and scholars often work in the service of ethicalisation. One specific outcome of such ethicalisation is the maintenance of the status quo such that technological programmes are not substantively impacted by ethics [22].

A De-Politicisation of Ethics

These two aspects of ethicalisation can be said to reflect a 'de-politicisation' of ethics. This de-politicisation manifests in a co-optation of ethics such that the status quo is maintained, business as usual continues and a division between science and ethics is reinforced. An ideal of ethics discussions as "rational,

consensus-seeking deliberations" [11] (p. 18) dominates. This ideal is unproductive in the sense that the explicitness and controversy that marks ethics is expunged. Ethics and ethical expertise can be enrolled in the service of ethicalisation and, concretely, in the name of an ethics of progress, such that a more critical role is closed down.

Towards a Re-Politicisation of Ethics in Ethical Engagement with Quantum Technologies

Given prior experience with NEST-discussions and characteristic tropes and patterns of moral argumentation that tend to be repeated in NEST debates [11], it is not unlikely that a similar ethicalisation could play out for ethics debates around quantum technology. In the following, I propose some points of attention for a re-politicisation of ethics within the context of ethical debate on quantum technology. First, I suggest that in order to avoid a conversational mode of discussing 'quantum for good', there is a need to actively acknowledge and integrate stakes in discussion from the outset. One way of doing so is to reject an immediate win–win framing—which is a particular risk with the notion of a 'responsible technology' baked in to the notion of 'quantum for good'. A win–win discourse is founded on a seductive rhetoric of visions and prospects oriented around possible outputs and outcomes of research. An alternative is to stay grounded in the current landscape of development and to map and analyse *input* to technology development [13]. Such input includes funding priorities, research programmes, technological visions, broader trends such as digitalisation, abstract and concrete fears, and past and current hopes. An important step in this approach might entail mapping on visions and priorities to specific actors (and roles) who 'own' and seek to advance those visions. Ideally, these actors would be active discussants in ethical discourse. This would allow for a less symmetrical approach to ethical discussion to a mode in which asymmetries in power and priorities are laid out for all to see and engage with. In paying attention to asymmetries in power, we can move towards de-bunking the feasibility of a 'win–win' situation for all constituents involved in and/or affected by quantum technological development. One could argue that this is particularly key in the case of quantum technology, given

the asymmetries inherent in an environment in which corporate and state actors dominate development.

As regards the use of ethics expertise in a re-politicised sphere of ethical deliberation, I argue for the need for acknowledgement of the concrete stakes of ethics experts offering ethics advice. This is especially important in cases of the integration of ELSA and ethics programmes in larger research programmes. As ethics and ELSA experts, we are not merely 'handmaidens' to natural scientists and research programmes, facilitating ethics through ethical advice which, in turn, may be over or under-utilised. We are, rather, scientists and knowledge producers who also have 'stakes in the game'. These stakes are often subsumed in the ELSA service to technological programmes and in the need to obtain research funding and resources through integration in such programmes. I contend that these stakes should be reanimated and mobilised in ELSA collaboration. Taking the advice of Swierstra and Rip [11], ethics and ELSA scholars—should be unafraid to make use of 'struggle' and learning in an arena of collaboration around ethics of quantum technologies. This requires us to be explicit about our expectations of collaboration and managing expectations as to what we are willing to contribute.

How might we do this? We can take inspiration from Smith et al. [23] who advance the proposition that Responsible Innovation—a socially responsible innovation approach similar to that of ELSA—is best thought of as a form of knowledge production that can be accessed through collaboration. Foregrounding knowledge production – or treating RRI as a form of research – allowed for certain opportunities, the most relevant of which for my argument here is an understanding of RRI as being valued unequivocally (not just as an 'add-on' to the main research); opening up administrative practices (e.g. if RRI is research, what does that imply for the structure of funding calls, for guidance given by the funder, for evaluators, etc.); and building institutional reflexivity (why is RRI of value in a given context and what does it look like in very practical terms?). These questions are also relevant for ethics and ELSA programmes and key to cultivating legitimacy. Ultimately, such questions push ELSA scholars to obtain clarity about their roles as ELSA experts not only with respect to how their roles are perceived but also regarding their capacity to produce useful and societally relevant knowledge. As

regards the latter, we may want to actively promote the kinds of roles and aspirations we seek to pursue (e.g. as 'critical friends' and co-producers of knowledge) and to state explicitly associated expectations.

Conclusion

'Quantum for good' is beginning to emerge as an ambition with which to orient quantum technology development. As a 'language of concern', the notion will be taken up by researchers, policymakers and ELSA communities. While ELSA scholars are likely to play a role in helping to determine definitions and practices of 'quantum for good', they should be attentive to the risks of ethicalisation and possible de-politicisation. A de-politicisation of ethics limits possibilities for identification and acknowledgement of stakes and interests, while maintaining 'business as usual'. An alternative rests on cultivating ethics as a process in which asymmetries in power are put upfront, decisions need to be taken, and ELSA research is valued unequivocally within the technological research programmes to which they are attached.

Declarations

Competing interests   The author declares that they have no competing interests.

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