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technology for social action**

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On Social Function: New language for discussing Technology for Social Action

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Designers of technology for social action can often become embroiled in issues of platform and technical functionality at a very early stage in the development process, before the precise social value of an approach has been explored. The loyalty of designers to particular technologies and to ways of working can divide activist communities and, arguably, has weakened the social action world's performance in exploiting technology with maximum usefulness and usability. In this paper, we present a lexicon for discussing technology and social action by reference to the intention and relationship to use, rather than to detailed functionality. In short, we offer a language to support discussions of social function, and thus to avoid premature commitment or argument about architecture or implementation details.

The need for new language

There is no doubt that new information and communication technologies (ICTs) can play an important role in the effective operation, organisation and co-ordination of institutions and networks that are working to bring about change in society. Such institutions and networks vary significantly: in their structures and operating practices - from loose networks through hierarchical social enterprises, to tightly defined democratic systems; in their histories - from hundreds of years to a few weeks; in their focus of attention - the needs of elders, human rights, social and economic development, the environment etc.; and in their scale - from Big International NGOs (or BINGOs) to small local community groups and even individual initiatives. These different groups also engage in very different sets of activities. We have argued elsewhere that the term 'social action' is useful to cover this very diverse space of institutions (Dearden et al., 2005), and to orient discussions towards the commonality of concrete practices, values and activities that characterise the space. We prefer to orient our work around the observable behaviours of people engaging in 'social action', rather the more abstract sociological or historical concept of 'social movement' (della Porta & Diani, 2006), or the structurally focussed term 'civil society' (Deakin, 2001; Gramsci, 1971). We do not wish to suggest that these existing terms are not useful, merely to argue that, in exploring how ICTs are applied by agents in civil society or by participants in social movements, the actions and activities in which these ICTs are applied provides an important and accessible unit for analysis.

The wide diversity of contexts of social action presents a major challenge for technology designers and researchers who are seeking to explore and articulate how their skills can contribute towards positive social change. There is no doubt that practitioners in these very diverse settings see the value of such exchange of knowledge. This is evident from the success of initiatives such as the Organizers' Toolcrib (toolcrib.ning.com), and conferences such as the N-Ten conference on Non-Profit technology (www.nten.org). These forums provide spaces for practitioners and researchers to compare their experiences, and to share advice. However, from the perspective of non-technical activists who are trying to make sensible technology choices, the discussions in these forums can be difficult to follow. Case studies can illustrate innovative uses of technology in particular settings, but it can be difficult for (non-technical) activists to recognise which case studies are most appropriate for their own particular problems, and how they can be translated to their own settings. Categorisations of tools, intended to help activists make choices, may mix terms for particular business activities, with terms for technical functionality, or for general activities. For example, the Organizers' Toolcrib offers the following primary categories: Advocacy/Fundraising/Engagement, Commerce, Communication, Data/Donor Management, Developer, Event Management, Full Service Suites, Fun, Information/Research, Mapping, Office, Project Management/Collaboration, Training, Volunteer Management, and Web Content Management. In face-to-face conversations, discussions can descend very quickly to detailed debates on the precise functional capabilities of particular tools (e.g. the relative merits of different content management systems). The following transcript of a conversation from a recent workshop illustrates this point:

- C) I don't really care what kind of form it will have, the simpler the better as far as I'm concerned. Just something where people pitch their ideas that they want to share with other people.
- B) I just want an easy place for people to pitch those facts.

- R) For ideas, there's X.com, which is a site for putting up ideas.
- A) There's a space on the forum, if someone has an idea you can post it up there already. People just type their idea. You know...
- C) That's the point I'm making, I'm not going to look through the forum to see who has posted an idea. Because I'm really really lazy -
- A) But if you want a location to put ideas -
- C) That's what I'm saying is I want a page -
- D) we need a left hand side for putting funding and a right hand side for putting ideas that need money.
- A) what I'm saying is that we have a website, we have a wiki, if you want to put it on the website, put it on the website, if you want to put it on the wiki, put it on the wiki, you can put it up there.
- L) use the hotseat, you can put a call and then answer it, then another call. It can be linked to pages and stuff, it's just a tool.
- S) the trick is to find the right tool for the purpose, yeah? Those things you've mentioned, I don't think any of those things will do. It needs to be designed particularly to bring two sides together. The notion of someone who has an idea, someone looking for a partner with an idea and a forum wouldn't do it, it must be a different kind of tool.
- D) The only two things it needs is that one's seeking and the other's offering. It might be that we are refining what we need and that the wiki is no longer adequate alone.
- J) Can I make a middle proposal? That we dump everything on a wiki page in the shortterm. Dump things in there and also start writing what the spec of this might look like.
- L) The drupal site has got a whole lot of functionality that, we are not even using the hotseat yet, we've got a system for tagging which could be a connector or a facilitator or whatever. Let's also not say 'oh drupal won't work'.
- D) no one's saying drupal won't work, but we're coming at it from the social side, saying we've identified a set of requirements, can you configure what we've got to meet that set of requirements. That's not saying go and use the page, we've got you a page. Because actually we are saying it would be easier if that page was configured for us a bit. And that's not saying what you've done is no use, but because we know you've done lots of interesting things that our brains can't access because they can't go oh look isn't this brilliant technology, we can configure it like this.

Part of the difficulty of establishing a lexicon for discussing technology in social action is precisely that many technologies can have multiple uses. Database tools can be used to manage donor relations, volunteers, or user contacts. Increasingly versatile systems such as Joomla, Zope, Drupal, etc. provide frameworks that can be used to support many different social action activities. Unfortunately, as these tools become more flexible and diverse, the technical language used to describe them necessarily expands. As Ehn & Kyng (1991) point out, a pre-condition for effective collaboration between technical experts and domain experts is the creation of some common language (game). Molich & Nielsen (1990) recommend that interactive systems need to 'speak the user's language'. In the case of technology and social action, we suggest that fruitful position may be to start investigating the role that technologies can play in social action starting from the perspective of the (non-technical) activist, rather than adopting language that we have accidentally inherited from (non-activist) technologists. In other words, we should begin by examining the role that technology plays in a particular social action situation, and focus on *social function*.

A frame of reference

Organisations, boundaries and relationships

Given the wide diversity of domains of social action (labour relations, environment, social development etc.) and the diversity of technologies to be considered, it is important to develop a frame of reference to underpin analysis. Diani has argued that actors in social movements:

- "are involved in conflictual relations with clearly identified opponents;
- are linked by dense informal networks; and
- share a distinct collective identity." (della Porta & Diani, 2006, p20)

From the perspective of activists involved in promoting a social change agenda, we might then distinguish these

groupings in terms of: 'Us' - those sharing the collective identity of promoting the social action or particular social change agenda, 'Them' - identified opponents whose behaviour we may be aiming to change, and 'Allies' the informal networks of supporters that are recruited in our social action.

In the wider context of social action, however, there are many groups such as voluntary organisations and charities who understand their role as primarily serving the interests of a particular section of society or 'constituency', with perhaps less explicit emphasis on conflictual relations. Many such bodies can easily identify Us (their members and supporters), Them (public and private bodies whose behaviour they want to modify) and the Allies with whom they engage to promote their agenda. However, their primary focus is often on the needs of some particular group of people who are disadvantaged by existing social relations, and thus it is often possible to identify a further category:

Our Constituency - for a group like Age Concern in the UK this would refer to older people, for Oxfam it would refer to people living in developing countries, for the Royal National Institute for the Blind it would refer to people with visual impairments.

Finally, recognising that many members of the general public may be unaware of the issues that motivate our actions, and who therefore may not be legitimately classed as 'Allies', we can usefully add a fifth grouping:

The General Public.

Because 'our' relations with these different groups are different, and the objectives we set in interacting with them are different, the ways that we apply technology in relation to them will be different.

Technology as or for Action vs. Technology supported Action

Instances of Technology and Social action must always be understood as fundamentally socio-technical. In any situation where technology is used in social action, we need to consider not only the technology, but the people and practices that apply the technology to social action ends. In any given case, we can distinguish between the organisation (individual, group or collective) that originally 'provides' a technological artefact and the organisation (individual, group or collective) who operate the artefact to undertake 'social action'. Some artefacts may be provided by 'Us' and operated by 'Us', others may be provided by 'Us' and operated by 'Allies' or by 'Our Constituency', or possibly by 'Them'. Note that the 'provider' of the artefact in this case, is not necessarily the same group as the software developers for the artefact. The 'provider' is the group, individual or organisation, that manages the project to make the artefact available for social action. This may mean that a group develops some new technology themselves, a group may commission someone to build some technology, a group might buy and deploy some off-the-shelf technology. The defining point is that the 'provider' changes the situation from one where the technology is not available to a situation where the technology is available. The framework needs to recognise this distinction. In some situations 'Us' provides technology for social action that is then operated by 'Allies' or 'Our Constituency', or even 'The General Public'. For example, the website TheyWorkForYou.com gives members of the general public in the UK (and any other users) detailed information about the voting records and actions of Members of Parliament. This alters the power relations between the public and their MP by making it easier to call the MP to account for their actions. For the providers of 'TheyWorkForYou.com', the provision of the technology IS their social action. The availability of the technology changes the society. In a similar way the 'Serious Games' movement (see, e.g. Flanagan et al. 2007) produces computer games through which they hope to communicate important ideas or messages to the players. Again, the provision of the technology is the game developer's means of taking social action. In the framework below we use the term "Technology *as* Social Action" or "Technology *for* Social Action", to connote this approach. In other situations, 'We' provide the technology and then operate the technology ourselves to undertake social action. For example, we might create a content managed website and then use this to publicise issues, or if we might use a database to manage contact information that we will use to invite Allies to join a demonstration. In the framework we use the term "Technology *supported* Social Action" to refer to this kind of use of technology.

The distinction between Technology *as* Social Action and Technology *supported* Social Action can be made simply by considering whether the provider and the operator of the technology are the same group or organisation. In Technology supported Social Action, the provider and operator are the same. In Technology *as* Social Action, the operator is part of some other group distinct from the provider.

Understanding Social Function

Given that we can identify the relevant groups (Us, Them, Allies, Our Constituency and the General Public), using technology for social action is oriented differently towards each of these groups. Aims in relation to each group are

typically:

Our Constituency	Ourselves & Allies	General Public	Them
1. Improving situation and confidence in power relations with 'them' 2. Improving access to goods and services	3. Smoothing operations and management 4. Supporting and funding action 5. Continuous strategic learning to improve our performance	6. Raising awareness and educating around the issues we regard as important.	7. Challenging their power by holding 'them' to account, highlighting their actions and interests 8. Organising and co-ordinating actions by ourselves & others to exert pressure on them.

Table 1: Objectives for different audiences

The 2006/7 strategic analysis of the voluntary sector published by the National Council for Voluntary Organisations (NCVO, 2007) is organised around chapters on the following major functions.

1. 'Providing voice and building a better society',
2. 'Delivering services'
3. 'Leading and managing voluntary and community organisations', and
4. 'Supporting and funding voluntary action'
5. 'Strategic responses'

These five categories can be mapped relatively easily to the first five concerns in table 1 above and perhaps reflect the difference between the radicalism that is typical of the groups that Deakin (2001) examines in terms of social movements, and what could be interpreted as the more moderate ambitions of the voluntary sector. However, in practice, supporters and leaders of voluntary sector organisations in the UK and in other countries are often deeply aware of the wider social context of their work and active in seeking major social transformations. Thus in their work of 'providing a voice' and building confidence, voluntary sector groups often act to challenge existing power relations and hold 'Them' to account (7). Thus items (1) and (7) may be seen as closely related. Indeed, in promoting such transformation of society, it can be argued that little has changed since Montefiore's tract of 1918 was published under the title: Educate, Agitate, Organise (Montefiore, 1918). Thus we can identify the following key social action functions where technology may have a role:

	Technology as Social Action	Technology supported Social Action
	<i>We provide a technology, allies or constituents operate it.</i>	<i>We provide a technology, we operate it.</i>
2	Technology as pathway (to services)	Technology supported pathway
3	Technology as operations	Technology supported operations
4	Technology as funding and resourcing	Technology supported funding and resourcing
5	Technology as organisational learning	Technology supported organisational learning
6	Technology as education	Technology supported education
1 & 7	Technology as agitation	Technology supported agitation
8	Technology as organisation	Technology supported organisation

In the next section, we shall define the categories more precisely, and provide examples to illustrate each one. However, before moving on, we need to clarify two boundary categories that stand orthogonally to this framework. There are (at least) two examples of activities that are related to social action and related to technology, but in a different sense to the sense that has been used in the above classification. This is not to belittle the importance of these phenomena. Instead it is to recognise the purpose of the classification above and to understand its limits.

Social Action on Technology Relations

Here the point is not the use of technology for social action (although there is a strong element of this), but social

action on issues that relate to information and communication technology. Examples include the Free / Libre Open Source Software movement; the Free our Data Campaign in the UK which is campaigning to ensure that data collected by the government (such as mapping data collected by the Ordnance Survey) is made freely available for use by the public (e.g. for mashups), rather than being sold to private enterprise; campaigns on digital privacy and digital rights. These examples share the combination of technology concerns and social action concerns. However, the point is that any of these campaigns could use technology in any of the ways listed above. Alternatively (although unlikely) it would be theoretically possible, to conduct these campaigns without actually using any computational technology.

Supporting Digital Skills as Social Action

This is working with a community to enable them to manipulate digital cultural artefacts, developing their confidence and their ability to be heard. The technology here plays the role of a domain in which people can be empowered and can recognise and realise their potential. A good example of this is the Open Source Embroidery project at Access-Space <http://open-source-embroidery.org.uk/>. Similar objectives in the sense of empowering people might be achieved by using other technologies or other skills as the means by which people develop their confidence and power.

Understanding the categories

Technology as pathway

In this category, *we* provide a technology that is operated by our *allies* or our *constituency* to provide a pathway to some service or resource. The services may be digital services or they may be practical services. The provision of the technology IS the action. This category includes the creation of accessibility technologies such as screen readers. A very different example is the Loband project (www.loband.org) that provides a pathway to the Internet for users in developing countries or others who have limited internet bandwidth available. The loband server is a proxy which will download a page and then deliver only the text content of the page, stripping out any images, animations or other 'bandwidth hungry' items.

Technology supported pathway

Here, *we* provide and operate a technology to aid us in delivering a service or benefit to members of our constituency. The NetNeighbours scheme (Blythe & Monk, 2005) operated by AgeConcern York involves volunteers who have internet skills placing orders on-line supermarkets on behalf of housebound elderly people. Here, the technology used includes record keeping about the orders placed, management of deposits etc. to ensure that both volunteers and beneficiaries are protected from unfair losses. On a different scale, various organisations including the International Red Cross are using Humanitarian Logistics Software (see http://www.beyondphilanthropy.org/reviews/lynn_fritz_the_compassion_of_logistics) to manage delivery of emergency aid represent an instance of operating a Technology Supported Pathway. In some cases, the pathway may provide access to mutual support. Thus, many on-line communities exist to provide mutual support for people suffering from particular medical conditions. This is recognised by the pattern Mutual-help medical website (http://www.publicsphereproject.org/patterns/pattern.pl/public?pattern_id=734).

Technology as operations

Every organisation uses tools to manage their internal operations. In this category, *we* provide technology to deal with the day to day operations of social action groups, and allies operate that technology. Basic capabilities might be keeping accounts, managing minutes, handling payrolls, supporting email, running an intranet etc. Examples include: Developing simple accounting packages that are targeted at the needs of NGOs, for example making it easy to map spending back to different funders and projects according the restrictive conditions that are often attached to funding grants; iContact (www.icontact.com) provides technology for managing email newsletters, blogs, surveys etc. for use by community and non-profit organisations (as well as selling these services to businesses). This category opens up the possibility of a commercial software vendor undertaking social action by making products available for free or reduced prices to social action groups.

Technology supported operations

A more typical situation is that social action groups acquire technology that they use themselves to manage their operations. Such a large proportion of the ICT that is used in social action settings fits into this category that it becomes difficult to choose any specific examples. However, some innovations are interesting. For example, a network of

organisations facilitated the North Yorkshire Forum for Voluntary Organisations operates a shared database for event planning, room booking, contact management. This system is provided using simple office productivity software delivered to the member organisations over the web using a Windows Terminal Service.

Technology as / for funding and resourcing

In this category, *we* provide technology that helps allies to obtain funding and resources. In the UK various examples exist including: Funderfinder.org.uk, GrantFinder.org.uk, and Trustfunding.org.uk. But funding is not the only type of resource that social action requires. Other resources may include computing equipment, skills, volunteers or paid staff. Technologists can intervene to assist social action groups in obtaining these resources, for example by providing training, operating computer refurbishment and recycling projects (cf. www.access-space.org), operating on-line volunteer or job search facilities. Some aspects of the work of Tees Valley Community Media (www.tvcm.org.uk) can be understood in this way. Here TVCM work with communities and help them to develop skills in managing technology to support community activities.

Technology supported funding and resourcing

In this category, *we* operate technology to obtain our own resources. Here we may consider a group using a shared document editor (e.g. a wiki), and managing email lists whilst working on a funding bid. Similarly, a group operating donor management, or supporter management systems could be considered to be enacting 'technology supported resourcing'.

Technology as organisational learning

Here *we* provide a technology that allies operate in order to enhance their organisational learning. Here, a technological artefact is created that embodies learning relevant for social action. The Organizers Toolcrib (toolcrib.ning.org) is a good example here. The Toolcrib provides an indexing framework for organisers tools, and encourages sharing and discussion of experiences. Another example of providing technology *as* organisational learning may be around CPSR's PublicSphere pattern language Project (www.publicsphere.org, Schuler, 2002). Here patterns as a structuring device, and the pattern language editing tools produced by the project, can be seen as technologies that are provided to effect organisational learning on a global scale.

Technology supported organisational learning

We provide a technology and we operate it to enhance our organisational learning. Of course, this may be within a closed organisation or might be between a variety of collaborating organisations. Examples include LabourStart (www.labourstart.org) a news network for the international Trade Union movement, supported by volunteer effort and by donations it is targeted at trade unionists; and the Open Knowledge Network (www.openknowledge.net) which supports sharing of information and knowledge between NGOs in developing countries.

Technology as education

In this category, *we* create some technology with the goal of influencing / challenging / changing the ideas of a user of the technology. In this case, the producer of the technology is communicating directly to an external audience. Note that the technology here can be any form of digital artefact. This may be some digital media file, it may be a hypertext, it may be a complex piece of software. The point is that the design of the artefact requires distinctive technical skill. A simple example was the We Shell not Exonerate message which was circulated in the run up to the gulf war (http://www.lifeisajoke.com/pictures492_html.htm). Because the image was both clever, and funny, many people then forwarded it to their friends in a form of 'viral marketing'. A more complex technology used for such political education comes from the 'Serious Games' movement. Game designers like Mary Flanagan and colleagues (Flanagan & Nissenbaum, 2007) have used the technique to address issues of women's rights and self image and of conflict. An example of Flanagan's work is a three player game using a chess set, but where one player organises both the black and white pawns to prevent war breaking out between the black & white major pieces. Other critical design actions such as Critical Technical Practice (Agre, 1997) Design Noir (Dunne & Raby, 2001) may fall into this category.

Technology supported education

In this category, *we* provide and operate a technology that helps us to distribute social comment and other educational material to raise the awareness of allies, our constituency, the public and/or them. This form of social action is distinguished from Technology as education, by the fact that the technology that is the focus of this activity is a tool to enable people to create and distribute texts or other digital artefacts. The most common example of this would be

providing a content management system for a social action organisation's outward facing website.

Technology as agitation

Here we provide a technology that is operated by allies, our constituency or the public to improve their position in relationships of power. One focussed example is the Martus project (www.martus.org). Martus provides secure software to support information management in human-rights organisations, and ensures back-up of the data to protect the organisations against data-loss or threats from repressive governments. Another example is TheyWorkForYou.com where the aim is to alter the power relationship between members of the UK parliament and electors, by making it easier for electors to monitor the behaviour and actions of their MP. In these examples, the availability of the technology changes the power balance between *our constituency* and *them*. A key design concern for many of these tools is providing effective and dynamic visualisations of relevant data.

Technology supported agitation

Here, we provide a technology and operate it, so as to enable our allies or our constituency in power relations. The VerifiedVoting project (www.verifiedvoting.org). This project by Computer Professionals for Social Responsibility provided and operated an information system to register election incidents in US elections, for example problems with voting machines. The provision of this information system alters the power relationship between voters and the electoral bureaucracy by centralising the collation of reports of electoral irregularities, thus enabling people to act collectively to challenge system problems. A somewhat different example is the Intelligent Giving (www.intelligentgiving.org) which promotes discussion of the work of charities so that donors can consider which charities they might wish to support or not support.

Technology as organisation

Here we provide a technology that is operated by others to organise their collective actions. Many of the examples below permit the creation of new 'mini-organisations' that may exist to support one particular social action, but other arrangements are possible. Examples include JustGiving (www.justgiving.com) which is a social action operated by a private sector company. The technology provided allows a member of the general public who is participating in a sponsored fundraising activity to set up an on-line sponsorship page, to which they can invite their friends / contacts to support the work. JustGiving provide technology to handle on-line payment, and recover tax relief on the donations. Justgiving then take a payment out of the tax relief so that the amount raised for charity is greater than the amount given, but Justgiving also cover their costs and make some profit. PledgeBank (www.pledgebank.org) operate a website where a member of the public can make a pledge to undertake some action (e.g. to cycle to work rather than driving, or to donate some amount to charity) but only if some specified number of people match this pledge. This creates a mini-organisation of the people taking the pledge. CivicSpace (www.civicspace.org) is an open-source software tool that began life as a toolkit for organiser during Howard Dean's campaign in the US Democratic Primaries in 2003. The toolkit can be used for creating a website and for managing contacts and arranging events. Again, the action is making the technology available to allow others to organise.

Technology supported organisation

Here we provide and operate some technology in order to co-ordinate the actions we are taking to put pressure on 'them'. The International Transport Workers Federation users a shared database to record when ships have been inspected while they are in port. By sharing the records between union officials at different ports in different countries, the international union can ensure that their inspection regime does not duplicate efforts, and can monitor the performance of different shipping companies even though they are not working through a single port. The concept of Flash-mobs co-ordinated using mobile phones, that was developed in the 2002 G8 protests in Seattle, is another example where technology is used to support organisation.

Summary

The framework above seeks to classify examples of technology and social action, not in terms of the tools use or the particular functionality of technical systems, but in terms of the way that the socio-technical system operates to achieve social ends, i.e. by *Social Function*.

Using the framework

The framework can be applied in a number of ways, both in the hands of social innovators, and the managers of existing social action groups (whether technical or non-technical), or in the hands of technology and systems designers.

Use by Social Innovators

Perhaps the most obvious usage by activists is as an auditing tool to review existing usage of technology in a particular organisation. Because this application is so obvious, it is not necessary to describe any particular approach here.

A second mode of use for an activist group is to use the framework as a guide when searching for new tools. The current design of the Organizers ToolCrib could be extended so that tools were indexed by the social function(s) that they were designed to support. At the same time, case studies that described how combinations of tools are applied to address particular social functions, could be indexed by social function and searched accordingly. Of course, although some applications are specialised solutions to particular problems, and so are suited to one or perhaps two particular social functions, other tools may be more general purpose. In this case, descriptions of such tools could include examples of how they can be applied to support different social functions.

Of course, recognising the social function is not the only issue that an activist might have to consider when choosing the right technology. Issues of the technical demands associated with particular solutions must still be considered, but a focus on social function would aid the non-technical activist in constructing an initial shortlist of potential solutions.

Use by Technology Designers

In what follows, we take one particular technology and social action project and illustrate how the designers of this technology can use the framework both to perform an initial auditing 'gap analysis', as well as using the framework to support reflective designing.

The EPSRC-funded Fair Tracing project (www.fairtracing.org) aims to help bridge the digital divide between Global North consumers and Global South producers by using tracing technology to enhance trade and reveal the value chain. Figure 1 shows one interface design that has been considered in the Fair Tracing project.



Figure 1: An interface design for Fair Tracing

Fair Tracing has as its heart the representation of a socio-technical system, with its emphasis on the social, economic and environmental aspects of food production as a means of profitably connecting Fair Trade and other ethical producers in developing countries with ethical consumers in the North. The political elements of the production system will be displayed as part of telling the story of the value chain. A significant challenge will be representing the power relations so that they can be understood - and challenged - by multiple communities. In addition, the system will be designed to allow individual products to be traced from production to consumption, giving small producers in developing countries access to the auto-identity technologies being developed by the global corporate giants and helping them keep up with the accountability required of them by European distributors. Clearly this is intended as a

tool for social change and a complicated one at that. What kind of tool is it intended to be and how can this framework support its design?

We have argued that there are two stages of development that this categorisation can support for the social innovator. The first, auditing and gap analysis, established the innovative value of producing a tool at all. It was noted that what we would call here end-to-end *pathways* existed for Fair and ethical international trade: there are ecommerce tools and means of connecting producers directly to users (eg www.justchangeindia.com). What did not seem to be in evidence was a way of authenticating the value chain and encouraging understanding of it. If we apply the framework here, we can see that this gap had a dual aspect: there was room for both providing a learning tool and the more directive activity of agitating by making power relations apparent. While a tool that only shows power relations between producers and consumers would be naive and might conflict with the opportunity to promote ethical goods, one that explores the dynamics of the value chain in detail can combine the role of informing the players with challenging redundant and exploitative practice. This raises the issue of creating an interactive representation that is both informative and sufficiently open to show the interpretive nature of the material. And it is apparent that not only do the designers need to represent the system of production, but they have some responsibility for describing the provenance of the material being represented, and so need to consider making the system of collection and allocation transparent.

From this discussion, it is already evident that the categorisation could have a secondary operation as reflective design aid. Let us take it further:

In working to create a means of giving products 'auto-identity', i.e. using digital tracing technology to allocate each individual product a unique identity that can be tracked throughout the value chain, the designers are creating operations-technology. This requires maximum flexibility in how data may be entered and support for various data forms, so that contributing can be handled by value chain actors at any stage and from any platform. Although the tool is not intended to offer an internal tracking function, it is being designed to extract some of the same information as would pass linearly through the system in a tracking tool. Instead of a linear process, it pulls information about the journey of the product into an alternative system that is platform-agnostic. Thus it needs to take on board learning from the operations-technology canon but recognise its differences. Understanding these differences is supported by recognising that the tool is simultaneously intended to function in several other ways.

The Fair Tracing tool will allow small-scale producers in developing countries to show off their products to advantage with the opportunity to communicate directly with consumers and distinguish their offering with production information from along the chain. What is going on here? This is a learning function in that brings with it complicated information management aspects that need to allow recipients of the information to filter according to their interests at the time. So while the tool is representing a particular product at point of sale or at the supper table, it should also respond to customisation instructions from the end-user as to what they want to know given their ethical priorities and task.

Meanwhile, further functions can be supported such as allowing the addition of audio-visual and narrative material to present stories along the value chain, for example tales of social welfare and community initiatives by chain actors. In encouraging the generation of expressive materials that represent the communities at each stage in the chain, the designers are creating organisation-technology - with the possibility of generating social capital as another outcome.

What hasn't been decided yet, but needs to emerge, is whether this research project should deliver technology *as* action or work eventually as technology *supporting* social action. Under either option, issues arise of how funding & resourcing will be handled, and whether the technology needs to include some accounting functions to measure usage by different actors, or to draw in additional resources. What is the minimal support structure needed for such a system to operate? Peer to peer design underpins the technical architecture with the intention of minimising the load on any one player. However, there is a significant difference between releasing Fair Tracing into the wild so that any players - at any point in a value chain - can use it and then seek to build a chain round themselves, and, alternatively, keeping it more organised by insisting that chains commit together and sign up to be part of some FairTracing federation. Under this latter option, FairTracing implies Technology supported learning, organising, operating and agitating. While this latter would take more infrastructure, industries seeking to get the best from it may choose to adopt it in this way. Understanding both models helps to facilitate the design choices embedded and the political discussions around them.

Conclusion

We have presented a framework for considering Technology and Social Action that emphasises Social Function. We have demonstrated how this terminology can support more effective action by supporting conversations between technology specialists and social activists. In particular, it can support auditing and gap analysis, aid activists in searching for appropriate technologies to progress their action, and support technology designers and social innovators in reflective design.

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