The politics of co-configuration in participatory design: a technological frame perspective

The Politics of Co-configuration in Participatory Design: A Technological Frame Perspective

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ABSTRACT
An argument for the use of the concept of Technological Frame by Bijker to understand the constructionist and semiotic power dynamics of different groups in participatory design is presented. This is illustrated with case study of design in rural Kenya. It is shown how dominant groups' frames can construct meanings of design decisions in terms of whether they are appropriate or not. The political leverage of the scripts embedded in artefacts used in the process of design is also explained from a semiotic perspective.

Author Keywords
Technological frame, semiotic power, micropolitics, participatory design

ACM Classification Keywords
H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

This paper presents a case study based on the design of information and communication technologies (ICT) in bridging the technological divide for the developing world. This was done in the context of ongoing experiences of the project 'Village eScience for Life' (VESEL) (http://www.lkl.ac.uk/projects/vesel/), which was part of a wider network of projects coordinated from the UK, Bridging the Global Digital Divide. In here I reflect on of the politics of participation that took place during the project. I frame this discussion by making reference to the concept of technological frame (TF) (Bijker, 1995) developed to make sense of the social shaping of technology and the technological shaping of society. Bijker's TF places an important focus on the political processes influencing socio-technical change, including design.

The objective of the VESEL project was to design mobile ICT for rural farmers in Kenya in order to promote the transfer and exchange of agricultural knowledge (Camara & Abdelnour-Nocera, 2013). The main objective was to provide local communities with access to information so that they can improve their profitability and quality of life. The project started in September 2006 with a team of university researchers (UK university experts in telecommunications, renewable energy sources, sensor technology, education and user interface design from five UK universities and local experts at Nairobi University) who worked with two communities of rural farmers in Kenya.

Factors such as culture, existing technological infrastructure, ethics, and user and stakeholder participation are critical for the success or failure of ICT projects in the developing world. The same situation applied to VESEL, in particular when researchers from diverse disciplines engaged with communities who have different cultural expectations of technology from those living in countries with easy and frequent access to ICT.

VESEL had two arenas where participatory design (PD) took place: one with the farmers and one where researchers from different disciplines interacted to make and evaluate design decisions from knowledge gathered with the farmers. I argue that the concept of TF contains theoretical elements that can be used to analyse the politics of participation in PD by identifying the dominant perspectives, i.e. frames, and the different artefacts that mediate design decisions and participation by all stakeholders.

TECHNOLOGICAL FRAME AND ITS POLITICAL DIMENSIONS

How we bridge the technological divide may well mean something different to the Kenyan farmers we worked with. With this in mind, we thought of TF as a '(...) framework for assessing how context and local culture shape the utility and usability of systems in situ, that is, once they are deployed to their actual contexts of use' (Abdelnour-Nocera et al., 2007). This concept was first developed by Bijker in trying to understand the socio-technical processes that guided the interactions of groups of scientists and technologists in the invention and development of bakelite and the fluorescent lamp. TF is constituted by knowledge, assumptions, expectations, practices, workarounds and other tools shared in a community that influence how meanings are attached to technology and how it evolves within that community.

Bijker's approach has been useful in previous research that aims at understanding the political processes involved in PD (Sarkkinen, 2004) the implementation of intranets in complex organisational settings (Pellegrino, 2005) and the adoption of enterprise information systems by small companies (Abdelnour-Nocera et al., 2007). TF have also been used in information systems (IS) research in trying to understand how users make sense of

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groupware and intranet technologies as these are introduced into organizations (Khoo, 2001; Lin & Silva, 2005; Orlikowski & Gash, 1994).

The power of the TF concept lies in the dual consideration of the constructionist and semiotic processes that underpin the appropriation of systems: constructionist, since it focuses on the interpretive flexibility of technology; semiotic, since it studies how the 'scripts' inscribed in technology configure its users (Akrich, 1992).

TF have already been used in previous research to understand the political processes involved in the design and adoption of technology within organisational cultures (Lin and Silva, 2005; Pellegrino, 2005; Sarkkinen, 2004). According to Bijker (1995) this configuration occurs through the exercise of power in which two political processes take place: one referred to the 'micro-politics' of creation, transformation and negotiation of meanings attributed to technology, in which powerful groups tend to impose their own perspectives; and other referred to as 'semiotic power', in which meanings, once fixed in diverse elements of a TF by dominant stakeholders (e.g. artefacts, accepted practices, norms, etc.), in turn constrain and structure action and particular interpretations of technology. The idea of semiotic power is derived from semiotic approaches in the Sociology of Technology, which study processes of user and producer configuration (Mackay et al., 2000; Akrich, 1992; Woolgar, 1991). These approaches coincide with Stuart Hall's (1973) ideas about the significance of cultural backgrounds in the encoding and decoding of media texts.

THE POLITICS OF PARTICIPATORY DESIGN IN VESEL

Thinking in terms of TF allowed the VESEL team to assess their own assumptions and expectations of ICT and anticipate and control problems that are likely to arise in the development of the farming support system. The main aim was to design technology in line with the TF of user communities. TF of the producer and user communities were explicated through the creation of socio-technical evaluation matrices (STM). Through the evaluation of scenarios and prototypes STM provided a way of analysing the situation so that the interpretive frames and practices of the different stakeholders in the project could be understood and modified or mitigated. However, in retrospective we could apply a political reading to what was the process of participation in the design of VESEL applications.

From a micro-political perspective, the interactions between the frames of producer and user communities in VESEL showed how the latter were configured by the former (Woolgar, 1991). UK and Kenyan researchers visited the villages with a pre-defined set of methods and technologies to probe the culture and requirements of users. While the local communities participated in activities such as card sorting to elicit predominant knowledge models, and diaries to depict their daily life, they were not involved in the choice of technology to be used or the low-level design decisions that were made later. This means the Kenyan farmers were not involved in the process of translation of local knowledge into design decisions as they were not 'domain experts'. This gave producers increased power to configure the users in VESEL.

An instance of semiotic power can be seen in the language used in STM, which was encoded in such a way that it defined the usefulness of VESEL for an audience of technologists and university researchers rather than users in the local community. As STM was internet-accessed and collaboratively used in an asynchronous way, it was impossible for community users to evaluate and participate in design decisions. Thus, the VESEL team sent University of Nairobi research students to convey initial scenarios and sketches of the proposed solutions in STM – this was a post-fact activity and therefore an attempt at transforming the TF of users, which could be seen as an instance of micropolitics of power. Similarly, it was seen how the design documents provided a 'script' for community members to follow (Akrich, 1992): it constrained and configured the type of activities and information sharing practices that users could do with the proposed system.

Nonetheless, this configuration was not a fixed linear process that went simply from the VESEL team to users in the community. As Mackay et al. suggest (2000) users can reconfigure the producers of a system: in order to accommodate technology into a culture: post-implementations accounts indicated users adapted the functionality of VESEL solutions without contacting producers, through workarounds.

These workarounds presented a form of cultural resistance and domestication of the VESEL solutions that not only involved material and cognitive work – in the sense of learning to use the system – but also symbolic work (Sorenson, Aune and Hatling, 2000). This symbolic work can be seen in how workarounds prompted by the introduction of VESEL solutions were not considered as provisional but as permanent in their newly created uses.

TOWARDS A POLITICAL UNDERSTANDING OF PARTICIPATORY DESIGN THROUGH TECHNOLOGICAL FRAMES

Explicating the TFs of the different groups engaged in PD of a technological solution will enable an understanding of sense making and political processes shaping the direction of design. Focusing on the politics of sociotechnical change TF offers a powerful explanatory mechanism as it involves the meanings, processes and artefacts driving PD. From a constructionist perspective, TFs highlight the micro-political processes whereby dominant groups manage to attach meanings to a design decision or artefact of what is, for instance, appropriate or not. From a semiotic power perspective, TFs highlight how scripts embedded in artefacts such as diaries, boundary objects or probes, among others, condition differentially the engagement of different actors in PD with the unavoidable income of certain groups having more leverage than others in this

Despite power imbalances in PD, the study of TF recognizes that the less powerful stakeholders are not always configured but also have opportunities to

configure directly or indirectly either other actors or the usefulness of the solutions being designed, even if this is in the form of workarounds. It will be interesting to discuss in the workshop the usefulness of this concept and how it compares to others used to study the politics of PD.

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