

Free/Libre Open Source Software for Bridging the Digital Divide

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INTRODUCTION: THE FORGOTTEN USERS IN SOFTWARE DESIGN

As some scholars claim, the digital divide, referring to the perceived gap between those who have access to the latest information technologies and those who do not, entails that not having access to this information is an economic and social handicap (Compaine, 2001). In software design, structured inequalities operate along the main axes of gender, race/ethnicity and class. Each of these in turn generates its own structure of unequal practices giving rise to institutionalised sexism, racism or class divisions/conflict. "Gender, race and class also crosscut each other in various complex ways, sometimes reinforcing and at other times weakening the impact of existing inequalities" (Cohen & Kennedy, 2000, p. 100). For instance, Webster's research (1996) employing feminist approaches to study computer system designs addresses the issue of a male-dominated system design field, which continuously excludes female users' needs, requirements, interests and values in the innovation process. She criticises that, "Human factors may be bolted onto existing methods of systems design, local and contingent knowledge of work and information handling processes held by users in an amorphous sense may now even be incorporated into the systems design process, but this does not create an awareness of the way in which skills and knowledge are defined in gender-divided terms" (p. 150).

In a similar course, I argue that users' experiences in developing or undeveloped countries are often ignored in mundane software designs led by developed countries. Although localisation of information infrastructure is an eminent issue emerging in current system development, profit-oriented products and services, such as Microsoft's local language program (LLP), do not really comply with local needs. Rather, this type of multi-languages software packages, a software suite fabricated universally for countries around the world, signify the phenomenon, which I term the "MacDonaldisation of Windows-Intel platforms," which in fact alienates users and the local contexts.

FLOSS IN ACTION

In recent years, free/libre open source software (FLOSS) has emerged as an important phenomenon in the information communication technology (ICT) sector as well as in the wider public domain. An increasing number of governments have endeavoured to either convert the public administration infrastructure from Windows to Linux or to adopt FLOSS for similar tasks (e.g., Munich in Germany or Zaragoza in Spain) (c.f., "Linux in Spain" on LWN.net; C|Net News.com August 29, 2001). FLOSS transparentises the often black-boxed software code and allows users to copy, distribute and modify a programme received freely. In making source code available, software technologies can be challenged, adapted, and ameliorated to satisfy diverse user needs. Apart from solving the prolonged usability¹ problem in software engineering, implementing FLOSS also helps ground both social and technical knowledge in locales and bridge the digital divide. In other words, implementing FLOSS facilitates technical knowledge (e.g., programming skills and ICT expertise) and social experiences to be transported and transferred through the acclaimed practices of social networking and mutual help noted prominently in many recent community studies (e.g., Wellman, 1999; Rheingold, 2000; Hampton & Wellman, 2003; Jordan et al., 2003; Lin, 2004a).

There have been a number of tactical considerations of implementing FLOSS in countries or organisations devoid of intellectual or financial resources: for economic reasons to save software costs; for educational reasons to improve human resource; for political reasons to stop monopoly proprietary software from expanding their market share as well as to gain digital autonomy, just to name a few. Hence, it is a strategic interplay for local governmental or non-governmental organisations (NGOs), and FLOSS activists to coalesce to tackle these inequalities. Because knowledge transfer is as crucial as infrastructure implementation, hands-on training made available to the local users is essential in the execution. Projects such as the E-Riders² and Low Income Networking and Communications³, or events such as the Summer Source Camp⁴ and Africa Source⁵, all illustrate the transfer of knowledge and technology across cultural borders. These examples

also show how the implementation of FLOSS shapes the lives and identities of local users as well as software developers around the globe (Lin, 2004b). Additionally, there is conspicuous implementation of Linux-based infrastructure in the local educational, NGO and governmental organisations in developing countries or regions (e.g., Washington Post, November 3, 2002). The advents of embedded technologies such as the “Simputer,” a Linux handheld applied in India, are believed to enable affordable, sustainable village development in places without phones and power, giving more and more people a voice in the conversation about their future (Cherlin, 2002). Wireless technologies are amongst others to bring the Internet to developing countries or regions to facilitate networking at both local and global levels. Krag, a Danish expert of wireless technologies who I met at the 2003 summer source camp in Croatia, describes wireless technologies as low-cost and decentralised. Here is a quote from his talk at the O’reilly 2004 emerging technology conference⁶ about the advantage of wireless technologies:

Billions of people in the world have never been online. The Internet as a technology is an elitist tool, reserved for the few and unreachable by the many. This is a problem not likely to be solved by the commercial interests of existing telecommunications companies and existing ideas about expensive, centralized infrastructure. But low-cost, decentralized wireless technologies could have an important role to play, in this respect. Their low price point and decentralized nature, and the openness of the standards, mean that these technologies are incredibly adaptable to new situations and new uses. (Krag, 2004)

Krag and his colleagues have been working in undeveloped/developing countries around the world, building up and promoting wireless technologies (mainly 802.11b standard, also known as WiFi) for the locals. They bring the Internet and intranet connectivity to those parts of the world not included in the plans of the commercial telecommunications companies. They teach and give hands-on training to the locals about how to use ICT, and at the same time build wireless networks in the countries they visit. In so doing, they hope to “not only raise awareness and heighten skill sets, but also gain the experience necessary to build a central repository of documentation and tools, targeted specifically at the developing world” (ibid.). Krag’s words subtly show that working with the locals de facto benefits the legitimate knowledge system of wireless technologies by means of bringing in more empirical cases that illustrate how infrastructure can be turned into applications, and how experiments can be turned into existing proofs. That said, working in undeveloped/de-

veloping areas in fact is not a one-way giving episode, rather, it is a reciprocal process that involves mutual help and mutual learning. Sometimes, extra functions are endorsed to the original products or facilities to meet local users’ needs or habits ad hoc. The local contingencies entail that products and facilities can be renovated with the new functions and features after being deployed in local environments. This close link with global and legitimate knowledge sets also suggests that local expertise is worth being documented or transcribed in order to understand the construction of a knowledge-based society from both macro and micro levels.

DEMOCRATISING SOFTWARE INNOVATION PROCESS: WHOSE DEMOCRACY?

Given the advantages of FLOSS, it is believed that FLOSS is seen as an effective tool and approach to tackle the digital divide. Although FLOSS provides more flexibility and economic good for local users, solutions are mostly identified and crafted from the point of view of the developed countries. The collaborative episodes between NGO and FLOSS sectors illustrated above show an ambition to mobilise awareness and participation, and build capacity. However, when taking the local requirements into account, the social problem of the digital divide is perceived merely in the eyes of some NGO and FLOSS workers, rather than derived from the locals. Whereas a FLOSS-based solution seems to bridge the digital divide more efficiently than proprietary software, it sometimes still ignores that the political-cultural position of the locals and does not automatically move towards the centre of the global society. The cultural differences between the outsiders and insiders at the locale influence which perspective in a FLOSS implementation (e.g., economical, educational, social, political, technical) should be prioritised. This decision is a tactic because in the decision-making process, NGO and FLOSS activists all identify and interpret the social problem from their point of view. For FLOSS and NGO activists, introducing and implementing FLOSS denotes a cultural shift of networking the local with the global. They believe that ideas and knowledge are the cosmopolitan valuables, and community building and social networking are the most effective means to engage these social capitals that can be amplifiers in an innovation system. However, the social problems have different meanings to the local. In some places, freedom of information is not the priority. Instead, to endorse the local economic purchase power is on top of any other concerns. Without taking the local interests into account, the design of the information infrastructure, which is out of

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