

Free/Libre and Open Source Software: Policy Support

FLOSSPOLS

Deliverable D 17 (cover page)

Gender: Policy Recommendations

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1 Executive Summary: Description of the Content of the Deliverable

The policy recommendations as outlined in this deliverable are a direct outcome of the anthropological research activities within the Gender Strand of the FLOSSPOLs project. Deliverable D22 outlined the reasons why there are so few women in the production process of Free / Libre / Open Source Software. The policy recommendations in this deliverable aim to address these reasons and suggest measures to increase female participation within F/LOSS. This document is structured in two parts.

First we outline the role F/LOSS plays in the current economic environment of European and worldwide software industries. Whereas the European Union is still at the forefront of F/LOSS production F/LOSS women within EU member states seem to be even less represented than in all other geographic areas worldwide (such as North and Latin America, Asia or Africa). Our recommendations are developed in line with the F/LOSS value system and social dynamics. This means that rather than telling the F/LOSS participants what they should change in order to increase the share of women in this field our approach focuses on the measures that can be undertaken by the European Commission (and / or other governmental institutions) to support the community and its members to integrate more female participants. Only activities that are accepted within the community of F/LOSS participants (male and female) will prove effective in their potential to change the current situation.

The second part of this document outlines the concrete recommendations. On the one hand these include concrete measures which require direct intervention in the form of travel funds to conferences, child care possibilities, supportive activities for younger girls and women advocacy groups, exchange programmes, etc. These direct interventions are described in recommendation 1, 2, 3 and 6. On the other hand we describe the more structural measures which address reasons for the low female participation within the F/LOSS community. This includes a variety of measures. Recommendation 4 aims to widen the development methods within F/LOSS. Recommendation 5 proposes that the European Commission prioritises funding for development of F/LOSS projects that already include women in prominent technical roles. Recommendation 7 aims to foster the understanding of the need for diversity for the technical success of projects. Recommendation 8 reaches out to make individuals in F/LOSS leadership positions understand that people are actively discouraged from taking part in F/LOSS and that this implies costs for their projects. Finally recommendation 9 intends to foster the role of F/LOSS in European innovation policy. This will contribute to the further professionalisation of F/LOSS and thereby provide paid working possibilities to women who are more dependant on those than men.

In the Appendix we include case studies that illustrate the success of similar measures in closely allied arenas.

2 General Discussion of Recommendations

F/LOSS still is a predominantly European approach to produce software. Again our survey showed there were more than twice as many participants from European member states compared to the US. This is in line with previous research undertaken in this field (e.g. Ghosh, Glott and Krieger 2002, Robles et al 2001). F/LOSS is a major motor for technological innovation and development and is becoming more and more relevant in the competitive field of commercial software industries (see section 7). F/LOSS already contributes considerably to economic growth in the field of information and communication technologies. This is important for larger corporations, but even more for small and medium sized enterprises which do not hold their intellectual stakes in software patents, but in the creative potential F/LOSS provides to them. With an increasing share in professional software production F/LOSS will be one of the fastest growing fields of employment in software industries in the upcoming decade. Furthermore F/LOSS is actually one of the few fields where information sharing and trans-national cooperation beyond the frontiers of EU member states is already in place and working. F/LOSS contributors are often highly mobile, flexible in their choice of working and living environment and continuously striving to increase their computer literacy. They can be considered as *the* workforce for the knowledge based economy.

Whereas the European Commission's ICT strategy over the last one and a half decades pointed towards regional cohesion and inclusion of users we argue here for an inclusion strategy that not only focuses on users but also on producers of ICTs. When F/LOSS as a sustainable form of technology production becomes an important factor in Europe's economic environment it is important to integrate as many groups within European societies as possible, in particular women who are so strongly under-represented. We believe that at this moment it is crucial for the further development of F/LOSS and its stakeholders to begin to make use of a broader base of contributors, i.e. that the community starts to integrate a larger variety of the society in its production process. Our survey, however, also showed that the European Union has a significantly lower ratio of female participants than all other regions worldwide (i.e. USA, Asia, Latin America, Africa). This should be particularly alarming for the European Commission which has an interest in keeping its competitive advantage in this field.

Because so many people begin their careers in software through early tinkering on computers,

F/LOSS would benefit from improvements in gender inclusion in both ICT use and production generally. The public policy instruments available to address these wider questions have been identified by the EC-sponsored Strategies of Inclusion: Gender and Information Society programme, as well as other international efforts such as the Commission on Technology, Gender, and Teacher Education, convened by the American Association of University Women (AAUW). Specifically, we would encourage focussing on educational interventions, as formal education seems to be much more significant for women's decisions to become programmers than for men (Margolis and Fisher 2000).

Here we limit our recommendations to those that are specific to F/LOSS; however, it is important to emphasise policies specific to F/LOSS are most likely to be effective in a context where women and girls are likely to engage with ICTs more generally. As we showed in section 4.1, the 'digital divide' issue with respect to F/LOSS is not only an issue of getting women interested in computers at a young age (although that does play a role), but the wider conditions within technological professions.

F/LOSS communities show aspects of organisation that require creative solutions. Institutionally, F/LOSS takes place sometimes within higher education contexts, sometimes within commercial contexts, and sometimes through groups of 'amateur' enthusiasts who self-organise through electronic communication and occasional face to face meetings. Self-organisation is very much at the heart of the F/LOSS community building, and much of the work is voluntary. Therefore the usual repertoire of recruitment and retention techniques deployed in large public or private sector organisations (such as quotas and flexible working), needs to be supplemented and adapted. This will require both creativity as well as resources. As section 4.6 shows, women are particularly disadvantaged by the reliance on unpaid labour. Again, here different policy spheres interrelate. Women are also disadvantaged in getting access to venture capital such as private equity financing (Amatucci and Sohl 2004). Although it is outside the scope of our remit, policies to address this inequity we believe would help make it possible for more women to become involved with F/LOSS.

Our recommendations are proposed on the principle that policy should explicitly aim to work with the community's values and social dynamics rather than impose its own. Public policy risks becoming irrelevant tick boxes and arbitrary bums on seats numbers if this fails to be the case. The SIGIS report (2004) stated four reasons why women should be encouraged into ICT professions:

- The justice argument points to the fact that women may be deprived of an opportunity to contribute to and influence a growing and important technology in all parts of the society.
- The equal opportunity argument points to women's rights to the benefits offered by the ICT industry labour market.
- The resource argument refers to societal losses when the scientific and technological talents and experiences of women are not utilised.
- The labour market argument highlights women's potential role in contributing to the supply of computer science educated labour to the industry (p 60.)

These reasons, however valid in researchers' or policymakers' eyes, are constantly challenged and critiqued by both men and women in ICT professions. This criticism needs to be understood and taken into account. The European Commission could very well have social justice and equality of opportunity as part of its goals, but to highlight these goals as part of policy action may in fact invite its own irrelevance to F/LOSS, which as we have demonstrated, believes itself already working for equality and social justice through meritocratic organisation. Anything that connotes special help based on gender is likely to undermine rather than assist. The EC and other public policy bodies would do well to recognise that the mere mention of gender raises in many peoples' minds a set of problems that, as individuals, they feel they are not a part of, and for which imagined remedies constitute a threat to meritocracy.

This is not to say that we are calling for an introduction of 'gender-blind' initiatives. Gender blindness is a fallacy which many scholars argue codes one set of gendered practices as normal, rendering other practices deviant or irrelevant (Wajcman 1991, Gill and Grint 1995, Faulkner et al 2004). Instead we argue that the more effective course is to design public actions with gender in mind, but based on the needs of the community and in a language that the community will read as legitimate. The goals of *rectifying the loss of a talented labour pool and with it the opportunity to build better technologies* is something that is already recognised as a problem within F/LOSS communities, and is far more likely to motivate action than social justice concerns. Therefore, we would recommend that these concerns be highlighted as the rationale for initiatives. We realise, too, that this approach, similarly endorsed by SIGIS, has been deemed 'perplexing [and] requiring alternative interpretations' by another scholar (Lin 2005) because it effectively prioritises women's economic contribution over social justice. However, our goal is to propose plausible pathways for

change. These need agreement from the community.

F/LOSS still is very much based upon voluntary work which people carry out in their spare time rather than as part of their paid labour. Therefore a lot of measures which are successfully applied in the work environments of companies, public sector institutions or others can not be employed in this context. This particularly concerns issues of discrimination, inflammatory talk, valuation of particular work tasks and so forth. Activities tackling these issues have to come from inside the community itself and we would rather not propose recommendations in this directions. It is up to the community as a whole to decide upon how it should organise itself and communicate this. It is up to single projects themselves to integrate measures such as rules of conduct or other forms of tackling the social dynamics set out above. On the other hand it is up to the European Commission to support activities and initiatives which aim to foster the role of women in F/LOSS and which help to increase female participation.

3 Specific Proposed Actions

We believe that mainly changes within the F/LOSS community itself can lead to both more women taking part in F/LOSS as well as to a shift in the way they contribute. Nevertheless there are possible ways public sector institutions can support such change. These recommendations have been developed for the European Commission, however many of them can be carried also by other public sector institutions on different administrative levels:

European Commission: all recommendations

Local authorities: 3.1. - 3.5, 3.8.

Regional authorities: 3.1. - 3.6., 3.8.

National governments: 3.1 - 3.8

3.1 Provide tangible resources to help women devote time to their F/LOSS activities. This means both funding helping women to take part at specific F/LOSS events, as well as continuous support to enable women to take part in F/LOSS projects over a longer period of time..

One major reason that women do not participate in F/LOSS is that it is largely produced in developers' spare time (see section 4.6). The survey results suggest that women in the community spend an extensive amount of their leisure time contributing to F/LOSS, too. However it is very likely that this is one of the barriers for women who do not have such an amount of spare time to spend on F/LOSS due to responsibilities related to household work and childcare. It is therefore crucial to provide tangible resources in form of facilities that enable women to devote time to F/LOSS. On the one hand this concerns events taking place offline, in particular F/LOSS conferences, hackathons, install parties and so forth. Funds would be necessary for organisers of such events to provide childcare facilities. Projects could include larger European conferences such as the FOSDEM (Brussels) or Linuxtag (Karlsruhe).

In addition, facilities are needed to help women in their continuous participation within F/LOSS projects on a more regular basis. It is important that F/LOSS contributors can devote several hours in a row on a weekly basis for their F/LOSS activities. Women often do not find the opportunities for this continuous time at home and therefore require a dedicated place to achieve their tasks. As it would require a large effort to create these facilities *specifically* for female participants of F/LOSS,

it would be more efficient to link to already existing facilities in public institutions (such as universities) which are already familiar with problems women face in computing, and have in place solutions which give opportunities to women. The Computer Laboratory at the University of Cambridge, for instance, provides computing facilities with attached childcare to their students and staff. These institutions are already in place and have proven their effectiveness. Special agreements could be negotiated so that women who aim to participate in F/LOSS projects can make use of these resources. The ubiquity of higher and further educational institutions throughout member states provides the opportunity to make a genuinely local and accessible solution available to a large number of women, building on infrastructure that is already in place. Funding would certainly be required as well as the establishment and co-ordination of the programme. This would have to include coordination on the local level to link these programmes to current or potential F/LOSS participants. Collaboration with local womens' advocacy groups provides an immediate avenue. In addition to universities we recommend a link to other institutions that foster the reintegration of women into the workforce (e.g. via adult education). A vital aspect of the above proposal is to put F/LOSS on the political agenda of educative measures (see also below).

3.2 Foster the participation of girls in F/LOSS activities at an early age.

Our research has shown that women in F/LOSS start both their computing activities as well as their contributions to F/LOSS in a later phase of their life (section 4.1 and 4.6). This causes some of the problems in their F/LOSS participation since they have to undertake a lot of 'catch up' work before they are able to contribute to much of the development activities (section 4.4) . It is therefore important to support activities that encourage girls to get into F/LOSS at a similar age as their male counterparts. This can be achieved though a variety of means.

Contribution to F/LOSS projects normally starts out with the installation and use of the software itself. Therefore the European Commission should support schools specifically in teaching computer skills with F/LOSS products rather than proprietary software (e.g. using OpenOffice rather than Microsoft Office suites, programming in Python rather than in Visual Basic). Formal education in computing seems to be particularly relevant for girls and therefore it would be helpful to integrate F/LOSS technologies already in school computing syllabi.

Furthermore many of our female participants reported the helpfulness of an all-girl environment

during their first phase of getting into computing and programming (e.g. schools, workshops, mailing lists). Whereas we do acknowledge that this might not be necessary for all potential female F/LOSS contributors it is important to understand that this is very effective for some. Therefore we consider short term interventions such as holiday camps with F/LOSS technologies for young girls interested computing as a way of minimising knowledge gaps and the resulting confidence problems, as these have proved to be a stumbling block in the later integration of women in F/LOSS communities. We feel that this would be best carried out in collaboration with already existing and experienced initiatives in that field (e.g. grepgrrls).

Despite the fact that a lot of activities related to F/LOSS take place online via email, IRC and other forms of remote communication, offline events are crucial for the feeling of being integrated within the community. On the one hand local events such as LUG meetings and install parties are important, but on a project level workshops and conferences play a far larger role. There seem to be less difficulties for boys taking part in these events, and they do so at a younger age than girls. Girls in their teenage years seem to be almost wholly absent at such conferences. It would be helpful to provide measures to enable women in this young age to go to relevant conferences. Grants should include direct funding for transport, but in some cases also special arrangements for accommodation. Support should not be directed only to girls giving presentations, but also to girls who want to take part to gather knowledge about FLOSS.

3.3 Provide support for the efforts to increase female participation that are already taking place within F/LOSS.

There are a number of groups, such as GNOME Women, Debian Women, Apache Women, Grepgrlls and LinuxChix that work to support women in F/LOSS. Whilst they are significantly different in their approach and philosophies, they could benefit from the same sorts of material support. This would include:

- Sponsorship for women to attend the main F/LOSS conferences
- Support for women's networking events
- Material resources (webspace, printing material, travel costs) to publicise and promote female engagement in F/LOSS communities (e.g. at the school, public technology fairs, etc.).

The latter activity is particularly significant, as men tend to be made aware of F/LOSS much earlier than women through informal networks in which women often do not participate.

3.4 The European Commission, and EU Governments should use their commissioning role to encourage a greater variety of working methods in the production of software.

F/LOSS communities tend to value writing code at the expense of other forms of work that go into producing software (see section 4.3). This can include (but is not limited to) documentation, user interface design, user requirements capture, community organisation, and software popularisation/marketing. Indeed, both men and women can be found doing these ‘other’ roles, but women are in practice more likely to be involved in these functions (see section 4.1), just as they are in proprietary software. If the EC were to encourage expanding and changing these roles it would be critical to have equal say in the final product, otherwise there is a danger of merely re-articulating stereotypes and expanding a continued marginalised presence.

Nevertheless, if projects were to actively seek more diverse participation, not in terms of personal identities but in terms of the processes by which software can be built, a broader range of talents and aptitudes could be recruited into the movement. This has the potential to destabilise gender practices by encouraging dialogue and learning opportunities. User-centred design, for example, both makes a more robust, usable product and sets new intellectual challenges for coders. In the space shuttle example documented in the Appendix to this report, documentation leads software design rather than coding. By encouraging dialogue, both of these disrupt the sharp distinction often made between technical leadership and social/managerial leadership.

The success of encouraging this sort of diversity depends almost entirely on its execution. The emphasis should be on destabilising and innovating rather than making F/LOSS ‘less technical’ (the space shuttle example also demonstrates this well). A situation where people felt that their ‘hacker’ identities, and the individualist flourish that comes with it, was under threat would be counter-productive. Similarly, some women expressed to us concerns about being ‘reduced to’ diplomatic roles and this is in fact a danger. Successful implementation would treat new organisational forms as a continuation of the way in which F/LOSS already sees itself as significant and creative innovators in ways of producing and distributing software, and already values a ‘thousand flowers

blooming’, as members are fond of saying. There are, for example, more or less ‘off the shelf’ techniques for organising software production such as agile computing and extreme programming which address these issues without compelling developers to commit to a rigid blueprint. These alternative forms of software production all have in common that they emphasise the fact that programming is a social activity. Further information about these methods can be found in the Appendix. All of these experiences and practices could be adapted and selected to meet particular project needs.

The EC has a range of mechanisms at its disposal to do encourage these innovations. It could, for example:

- Strengthen the development methods criteria in evaluating software proposals and actively seek methods beyond ‘code and fix’ that worked to prevent quick but buggy releases from being produced.
- Support proposals which identify innovative methods and provide advice on the successful implementation of them. For example, in our experience, user-centred design can often be a matter of lip service rather than actual practice.
- Provide training in usability, participatory design, and documentation methods.
- Expand funding for projects explicitly aimed at pioneering software development methodologies, and promote the results.

Using the EC’s own commissioning practices would solve the objection that ‘we don’t have the resources’ that is often used to justify the way documentation and usability is treated as an afterthought. It would also enable F/LOSS communities to recognise these skills as acquired rather than innate (and gendered) capacities.

Further information about software development methodologies can be found in the Appendix.

Commission to ensure encouragement is given to those who positively include women in technical roles or offer other means of support for encouraging girls and women to enter computing.

EC's funding practice is often very output oriented. Research proposals are evaluated mainly by the outcome of a proposed project rather than by the way this outcome is achieved. The project's consortium is evaluated on an institutional level and questions of diversity of the team working on it are often not taken into account. In terms of F/LOSS development we argue that the team producing software significantly determines its end result. The European Commission could foster diversity in the production of commissioned F/LOSS products by making proposers aware of this need for diversity. Matching funding could be provided preferably to research projects producing F/LOSS when the consortium's partners have already or will hire female developers in key roles.

3.6 Sponsor exchange programs or joint projects with parts of the world where coding is not axiomatically gendered as a 'male' activity.

While there is at least some agreement that sexist practices happen, many people are convinced that these involve 'other' men and therefore have nothing to do with their own behaviour. Significant change will only occur when individual members of the community recognise their own actions as counter-productive. Indeed, the 'HOWTO Encourage Women in Linux' article goes a long way towards helping its readers recognise potentially unwelcoming behaviour. Another way to break down this perception is by facilitating direct encounters with people who interrupt taken-for-granted categories—that is, put people in situations that take them out of their comfort zone and require them to reflect on how they interact with others. This technique has been used successfully to combat racism in a well-known UK school¹. In some parts of the world such as Malaysia, computer science programmes have half female students (Ng 1999), and it is considered a job 'suitable' for women (Berg Lagesen 2002). Indeed our survey showed for F/LOSS that in non-western countries the share of women is twice as high as in Europe and the USA.

Researchers sometimes talk about the importance of making these cases visible in order to unsettle gender dualities (Lie 2003), but this is unlikely to reach developers in any meaningful way.

¹ See <http://www.standards.dfes.gov.uk/studysupport/casestudies/georgegreens> for more information.

Facilitated face-to-face contact would do much more to alleviate the 'it's not me' problem. Although the particulars of such international contact would have to be tailored to particular projects, facilitating these contacts would have the added benefit of encouraging technological transfer into the European Union and directly support its competitiveness. The German government already experimented successfully with commissioning an exchange programs between the KMail project and collaborators of the PGP encryption technology in another context.

3.7 Create a greater understanding, through research and dissemination of projects where technological success was achieved because of diversity.

Women's activists within F/LOSS have already started making the case that more diversity is likely to lead to better technologies. They are frequently asked "what kind of better technologies?" The EC could help raise awareness about the answer to this question. There is debate within F/LOSS circles about whether programmes should be made user friendly, and this debate takes place in gendered terms (see section 4.3). However, within the community it is nearly impossible to question the value of stable, error-free software. There are in fact case studies and examples where changes in development practices went hand in hand with the inclusion of women, which in turn mean 'better' software (see Appendix for specific case studies).

Examples like these:

- demonstrate in no uncertain terms the value of thinking outside the hacker box, and the gains for software when women-friendly working practices are adopted
- demonstrate that 'social' concerns are technical concerns and make better end products
- help women developers feel less isolated and anomalous
- make women more visible to men in a context where they are often assumed to be invisible

In this context it would also be helpful to raise the profile of already existing women in F/LOSS projects and their different forms of contribution. Initiatives such as publishing interviews with female contributors to the KDE project, for instance, helped to make them more known within the community as well as outside the KDE project itself. Encouraging project leaders to communicate about existing women who are in their project to online media that are read by a larger F/LOSS

public (e.g. via forwarding contact details for interviews) would both make women more visible in the F/LOSS universe as well as would underline the efforts of the particular project to be welcoming to women.

3.8 Encourage individuals in leadership positions to recognise that people are being actively put off, not just failing to choose to participate, and that this has a long term cost to F/LOSS development.

F/LOSS puts a great deal of emphasis on charismatic leadership. These leaders therefore also must bear some of the responsibility for the culture they have helped create and shape. Sometimes male members do vocally support women in their attempts to counter sexist talk and the constant stream of sexual attention, either by becoming involved in online exchanges or helping to explain to other men appropriate ways to react to women's presence. With so few women this support is necessary, as lone voices are easily dismissed as over-sensitive or censorious. Such support, however, would be far more credible and effective if it were to come from well-known people in leadership roles. Discourse about gender focuses far too much on female disinterest, often legitimating sexist and inflammatory talk as just part of 'banter'. There are also discourses about the hostility that too often greets F/LOSS women, but the leadership could use their pulpit power to help the community recognise the cost of this 'banter' in terms of labour and potential software improvements. Currently, much of the leadership is unaware that there is a serious problem, and the discussion about the ways in which the cultural tone they contributed to affects women has not yet taken place. We suspect that the 'gender is nothing to do with my personal actions' problem sometimes extends to the leadership as well. This is an immensely challenging issue, as it is likely to raise hackles and accusations of divisiveness. Nevertheless, we feel that any lasting solution must have the support of those in leadership roles.

Again, the notion that talk should be monitored or regulated is easily de-legitimised as 'political correctness'. We feel that a plausible course of action is not to attempt to silence people, but for the leadership to make them aware of the cost they are incurring on the long-term success of F/LOSS. The articles that already exist on the subject indeed take this tactic.

It is well worth noting too that it is not just women being put off. For instance we found anecdotal evidence that suggests, participants from countries where adversarial talk is frowned upon also

leave the movement quite rapidly.

3.9 Foster a greater role for F/LOSS in European innovation policy, and specifically in university technology transfer activities.

Women are particularly disadvantaged by the lack of resources externally available for F/LOSS development, as they are least likely to have 'spare time' to devote to it. One way to secure women's involvement is by increasing the public sector resources devoted to its development. However, technology transfer activities for universities tend to centre on patenting and licensing exclusive rights. When projects are made F/LOSS in universities it is through decisions by individual researchers largely in the absence of institutional support. In the UK, for instance, there is a funding stream specifically for economic development activities, which has widened the scope of technology transfer activities. Even in these conditions F/LOSS software development rarely features. Yet there are plenty of unexploited opportunities for mutual gain in combining F/LOSS models with university 'third stream' activities (Willinsky 2005).

Putting F/LOSS on the technology transfer agenda would provide opportunities for highly educated women to participate as part of paid, stable employment. Through their advanced skills they are also likely to be in an advantaged position to take leadership roles and serve as visible role models. There are further benefits as well. Including F/LOSS as part of technology transfer activities would also help diffuse the fiercely dichotomised and entrenched debate about what some call the privatisation of universities, and therefore help to secure better co-operation and support for university commercial activities amongst faculty members and researchers.

What counts for universities should also be applied to other institutions – private or public – which use tax revenue such as research and development grants commissioned by the EC or national governments. It should be mandatory for publicly funded software to show the necessity to restrict public access to the outcome of their work by not issuing it under a F/LOSS license. This measure actually would not require extra funding or organisation though it would have a huge impact on both Europe's leading role in the field of F/LOSS as well as on the likelihood to increase female participation in F/LOSS.

4 Appendix: Case Studies of Diversity Contributing to Successful Technology Development

4.1 Lockheed Martin Space Shuttle Group

This is a highly prestigious example from the field of proprietary software that easily demonstrates the importance of diversity for good software. This group builds arguably one of the most reliable software in the world, which controls everything NASA's space shuttle does from launch until landing. Ten out of twenty-two members of the group are women, many of whom are in senior technical roles.

The reason the software is so error-free is the attention given to process and design. The code was successful precisely because they changed the relative value placed on writing code. In contrast to the dominant 'hacker' model, specifications are precise and teamwork is valued over individual inspiration. The creativity is in writing the specification and improving the process. In this way the supposedly 'soft' skills are re-evaluated as 'technical' and are not marginalised. Also, the group works ordinary workdays and does not stay up all hours of the night, which has particular advantages for women with family commitments. While there are important differences between this highly elite group and an average F/LOSS project, equally there are valuable principles that could be adopted and adapted.

For further information, see:

<http://www.fastcompany.com/online/06/writestuff.html>

<http://www.lockheedmartin.com/wms/findPage.do?dsp=fec&ci=13183&sc=400>

4.2 Carnegie Mellon University School of Computer Science

Carnegie Mellon has one of the most prestigious departments of computer science globally and has made a serious and successful effort to recruit women. Over the past five years they have changed their female admission rate from 5% to 42%. A central element of their success is the recognition that previous programming experience does not predict eventual computer science success, and they

stopped using prior experience with computers as admissions criteria. They have devised a flexible first year programme that takes account of various levels of experience. The continued quality of the programme demonstrates that being 'newbie-friendly' does not come at the expense of setting interesting programming challenges.

For further information, see: Margolis, J and A. Fisher, (2002). *Unlocking the Clubhouse: Women in Computing*. Cambridge, MA: MIT Press.

4.3 Open Usability Project

The Open Usability Project matches usability experts with free software projects, thus building more diverse teams of people working on Free Software projects. While its contributors faced at the beginning a somewhat critical response by KDE developers its role now is widely accepted in the production of this Linux desktop project. It is one of the projects in which usability is understood as a technical competence and its contributions (often by female participants) are not perceived as an afterthought.

For further information, see <http://www.openusability.org/>.

4.4 Xerox Parc

Lucy Suchman (1999) reports on a change in the relationship between technology designers and social scientists and usability specialists at Xerox Parc. Industrial research traditionally has been modelled as a disciplinary assembly line, where work is passed off to the next specialist in a queue. There has been a long standing mutual dissatisfaction in failure of technologies and ideas to 'transfer' from one to the other: one side 'fails' to take advantage of knowledge about users, the other 'fails' to address the needs of development, each rejecting the assumptions that created the demands for knowledge. At Xerox Parc this assembly line model has been replaced with mutual learning, and acknowledging partial translations and person's limited sphere of knowing and acting. In acknowledging that technology production is an extended field of alliances and contests, the 'divide' amongst different skills set is diffused, and people are better able to acknowledge the responsibility that comes with inhabiting a particular position.

With this shift in their own work practices they were better able to solve consultancy problems. For example, in work for a law firm they tried to engage users as collaborators in technology production, recognising the mutuality and overlapping nature of their work; not the ‘assembly line’ model. Attorneys described litigation support as monkey work, target for automation and outsourcing, but found these ‘document analysts’ had to carefully examine and encode thousands of documents, had to create a valid and useful database, could do some of junior attorney’s tasks. The attorneys underused the database due to their ignorance of its capabilities. Wanted to design something that would relieve the tedium, but help them maintain interactive control and judgement, thus ‘inscribing’ users’ value into the technology.

For further information, see:

Suchman, L. (1999) “Working relations of technology production and use” in D. MacKenzie and J. Wajcman, *The Social Shaping of Technology (2nd edition)*. Buckingham: Open University Press.

4.5 Ubuntu

Ubuntu is one of the most recent Linux distributions. It describes itself as “Linux for human beings”. It quite explicitly values diversity both in terms of social identities and the various skill sets that make software production and use possible.

It is one of the distributions that particularly allocates resources to tasks which otherwise are seen as afterthoughts such as documentation, translation, etc. The success in terms of usability is tremendous. Within less than two years it became one of the mostly used Linux distributions among private users.

For further information, see:

<http://www.ubuntu.com/community/participate>

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