Gendering Processes within Technological Environments: A Cyberfeminist Issue
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[1] Ensuring that women are empowered by any kind of technology requires that we investigate issues that are much more complex than merely the question of material access to the latest technologies. The technological practices surrounding the use and design of specific technologies as well as the gendering processes within the communities of production [2] in which these technologies emerged must be examined in detail in order for us to understand the (dis)empowering potential of any particular technology and associated technological practices. Thus, explorations of the gendered subjectivites that emerge within technologically mediated contexts across space, place and time are necessary if we are to design cyberfeminist technological environments.

[2] We are living in an age when development models from the West can no longer be considered to be fully reproducible in third-world contexts. Questions have been raised regarding the viability of simplistically and uncritically imposing technological practices and policy decisions based on what worked within the developed nations onto third-world contexts. In this essay, we explore issues related to everyday practices within communities of production by emphasizing the processes of gendering that shape and are in turn shaped by encounters with technologies of cultural and material production. Patterns for cultural and material consumption within historically situated relations of unequal power are thus simultaneously reproduced and shifted. In examining how they are reproduced, transformed and shifted, we may begin to understand how power is exerted to re-enforce existing hegemonies. In examining technological environments and community practices surrounding the situated design and use of technologies, we are concerned with the issue of whether "the bequeathed" are or are not empowered through the transfer of technologies produced and designed within socio-cultural environments situated in a Westernized and Masculinized world. The intention is to suggest a close examination of multiply mediated contexts of technology design and use as a model for understanding the scope for empowerment of women through information communication technologies.

[3] This article is based on a series of dialogues - published in print and online, "academic" and creative - between the two authors. One of us (Annapurna Mamidipudi) works with a group of volunteers who are trying to "revive" the old technology of vegetable dying and cotton handloom weaving in a few villages of South India. The other (Radhika Gajjala) is an academic whose work examines cross-cultural dialogue and the expression of women's identity among "virtual communities" and diasporic/postcolonial/transnational subject formations. She engages in the production and maintenance of web-based and email-list based interactive e-spaces. Both are situated within an increasingly digital and transnational economy.

[4] In our engagement with each other's contexts several issues surface both implicitly and explicitly. These are themes regarding globalization, Modernity and communities of production. Most salient of these as we see them today are - action (and governance) at a distance, differing spacio-temporalities of communities of production and the disciplining of transnational labor forces for a "new" digital economy. Implicit in these themes is the production and a fostering of a sense of a "new economy" that regulates everyday life through the use of intellectual technologies, practical activity and expert authority in all areas of social life, where epistemologies based in knowledge of contextual skills and expertise through the process of learning "how to" are devalued in favor of knowledge-making processes that privilege propositional knowledge. For example, Alcoff and Dalmiya (1993) describe an epistemological hierarchy between propositional and practical forms of knowledge which is implicit in modern epistemology. In describing how all knowledge in modern epistemology become propositional (i.e. information transmitted through impersonal propositions), they cite the example of how the expertise of midwives was invalidated epistemically, while their knowledge forms were constructed as ignorant "old wives's tales." The epistemic invalidation of old wives's tales

has been caused in part, by the fact that modern epistemology has forgotten the lesson from Aristotle that knowledge can come in two forms: propositional and practical (Alcoff and Dalmiya, 1993, p.220).

[5] These issues are related to layered co-existing and contradictory socio-cultural and economic systems of production and meaning-making processes in relation to time and space that make visible points of rupture as well as subtle and not-so-subtle shifts within the globalizing economy and postcolonial hierarchies, even as individuals and local communities retain different degrees of agency within structural constraints.

[6] The questions raised in our collaborations, lead to the need to further investigate how gender is produced within different technological environments ("old" and "new") in various communities of production. For instance, what gendered practices and tasks within these environments are associated with what kinds of power or lack of power? When does the "feminization" of particular kinds of labor get perceived as a social and economic handicap? Within what larger everyday socio-cultural and political/economic hierarchies do processes of "masculinization" and "feminization" get equated with power, domination, low prestige or with oppression? It is thus necessary to look at the historically and locally situated classificatory grids (such as definitions of "woman," gender, race, class and sexuality , as context specific categories) that shape the use and design of particular technologies and the environments created around their use. The very classificatory binary gender grid implicitly and explicitly adopted by many feminist studies of gender and technology can sometimes be considered as limiting for practical efforts to produce emancipatory technological environments. For example, in an exploration of possibilities for building e-spaces for the empowerment of women, one of us is faced with issues similar to those faced by many feminist activists and scholars who have begun to articulate the impossibility of isolating "Woman" as an isolated category which is often based in implicit assumptions regarding a universalized dual gender system which in reality is situated in particular socio-cultural and economic locations. As Alcoff and Potter point out, therefore,

> Growing awareness of the many ways in which political relationships (that is, disparate power relations) are implicated in theories of knowledge has led to the conclusion that gender hierarchies are not the only ones that influence the production of knowledge. Cognitive authority is usually associated with a cluster of markings that involve not only gender but also race, class, sexuality, culture, [geographical location, caste, language], and age. Moreover, developments in feminist theory have demonstrated that gender as a category of analysis cannot be abstracted from a particular context while other factors are held stable; gender can never be observed as a "pure" or solitary influence. Gender identity cannot be adequately understood , or even *perceived* , except as a component of complex interrelationships with other systems of identification and hierarchy (Alcoff and Potter 1993, p.3).

Further, as has been argued by postcolonial theorists, universalizing categories without regard to context is a colonizing act in and of itself.

[7] In exploring questions related to gender and technology, therefore, we complicate them with issues concerning class, race, caste, geographical location and cultural histories in an attempt to understand constructs of identity and ignorance which shape access to and empowerment through various technologies.

[8] In the contexts that we have so far examined in our past and ongoing collaborations , our investigation leads us to question "the specific cultural setting and world view that gives significance to these practices from the point of view of the bequeathers" (Marvin 1988, p.14) and how these can be at odds with the world views and everyday practices within the socio-cultural communities that we are attempting to "empower" and "bequeath." Thus, our approach to finding solutions emphasizes the re-designing of "new" technological environments, rather than a mere attempt at "transferring" so-called advanced technologies in the name of a notion of Progress that is in itself situated in socio-economic, historical and political contexts not necessarily empowering to all communities of the world. In making these connections, we emphasize specific contexts to show how everyday practices within the spheres of "culture" and "economics" are mutually shaped within historically situated unequal relations of power.

Technological Environments

[9] Simply said, technological environments are social environments shaped around the use of any type of "technology." Such social environments are place-based and their structuring is shaped by local and global histories, geographical conditions, and everyday cultural practices within which specific technologies are put to use. Doreen

Massey and other feminist cultural geographers have argued that concepts of space and place need to be formulated in terms of social relations. We find such bodies of scholarship useful in our attempts at exploring various technological contexts. For instance, Massey writes:

> If ... the spatial is thought of in the context of space-time and as formed out of social interrelations at all scales, then one view of a place is as a particular articulation of those relations, a particular moment in those networks of social relations and understandingsÖ But the particular mix of social relations which are thus a part of what defines the uniqueness of any place is by no means all included within that place itself. Importantly, it includes relations which stretch beyond , the global as part of what constitutes the local, the outside as part of the inside, [the past as part of the present]. Such a view of place challenges any possibility of claims to internal histories or to timeless identities. The identities of place are always unfixed, contested and multiple. And the particularity of any place is, in these terms, constructed not by placing boundaries around it and defining its identity through counterposition to the other which lies beyond, but precisely (in part) through the specificity of the mix of links and interconnections to that 'beyond.' (Massey 1994, p. 5).

[10] These identities get fixed for convenient articulation by universalizing, essentializing theory (which very easily and frighteningly gets authenticated in policies and implemented globally) but since this fixing happens in a top-down manner, such theorizing, unless vigilantly interrogated, risks becoming a colonizing move.

[11] It is important to once again emphasize the unequal power relations within which all the factors that shape such environments co-exist. Therefore, issues of whether the design of specific technologies creates certain technological environments, or whether the socio-cultural environments and communities of production within which such technologies are designed actually produce the "technology" (and the "Progress" associated with what the particular tool makes possible within such communities of production) are two sides of the same coin.

[12] Thus, a kitchen is a technological environment. However, it is not shaped solely by the various technological tools (be they ladles, grinding stones or blenders) used in that space. The geographical and architectural properties of that space, [3] cultural practices based in histories of cooking ("ethnic" or "McDonald") and based on different kinds of agricultural products available (either through trade and travel or through local farming and processing) in specific locations shape this technological environment. Even the way in which the people that inhabit the space, dress and occupy that space shape this environment and vice versa. For instance, a woman wearing a cotton, silk or nylon sari in a kitchen may need to structure her physical environment and negotiate the physical environment and cultural practices within a certain kind of kitchen in ways different from a man wearing shorts and a T-shirt in exactly the same technological environment.

[13] An urban office in New York is also a technological environment. It too is not shaped solely by the various technological tools (computers, fax machines, telephones, printers, tables, chairs) within that space. Examining the specific details of every such technological environment will reveal not only the culturally situated nature of such environments, but such an examination will also reveal the specific ways in which each technological environment is gendered. Therefore, the space designed for a telephone operator or a secretary in an urban office may be gendered in subtle yet specific socio-cultural ways, just as a kitchen designed for an all-American suburban household is gendered in often not-so subtle socio-cultural ways.

[14] However, one must be wary of drawing the automatic conclusion that "gendering" always occurs to the disadvantage of women in all technological environments across cultures, histories and various locales. While it might be interpreted that the kitchen being "woman-centered" is a disadvantage to women, since the responsibility and burden of kitchen work would then rest unequally on the shoulders of women, it could also be argued that the gendering of kitchen spaces to privilege its use mainly by women disadvantages men and teenage boys by making them dependent on the women of their family with regard to nutrition and taste. Situated within the local power relations of the kitchen and the suburban home and around daily practices of cooking and dining, it may sometimes be possible to see the gendering of the all-American suburban kitchen as "empowering" to women. [4] In fact, if popular culture portrayals of men talking to men in their leisure time are to be believed, [5] there might even be a "tyranny" of women in such spaces. But this domestic power that some women enjoy is situated within the more global material structures of power and discourses which describe kitchen work as less important in the larger socio-economic sphere , within an overall socio-cultural patriarchal framing of the society at large and within relations of power that prevent a majority of women from being powerful in various other socio-cultural environments. The

specific "empowerment" offered by the design of the technological environment known as the suburban all-American kitchen with all its fancy gadgets turns out rather to be a way of luring women to occupy their implicitly assigned place in society. The gendering of that space as well as the workload required to maintain the gendered nature of that space (all so that women can have the power to assert where the spoons go and how the counter must be cleaned if it is to be maintained as per the requirements of! codes of sanitized feminine perfection) in the larger socio-cultural and economic logics of everyday life therefore prevents "Women" in general from occupying positions of power in the world at large. Does that mean that individual women who feel they have been liberated from less efficiently designed kitchens should not be allowed to celebrate their beautiful kitchens and their domestic power? And is it necessary that just because a woman is in a situation where she is able to choose the kitchen as her territory even while having uninhibited access to, as well as the power to shape hegemonic practices in other spaces, she is to be considered as enslaved by kitchen work? No. It just means that such specific, locally situated ways of individual women's [6] empowerment does not equal empowerment for all women in all contexts, all over the world.

[15] Similarly, just because technological environments, and communities of production which are situated in certain Urban spaces sometimes allow (certain) women to empower themselves through computer and related technologies does not automatically suggest that merely handing computers to all women , rural and urban, first-world and third-world , will empower them. It does not follow, based on a few individual women's success stories that computers and related technologies as currently designed and used within the increasingly globalizing economy will be equally empowering to women in diverse communities of production all over the world. While certain types of technological environments get associated with global progress, their specificity is not adequately examined. Nor is the specificity of the notion of "progress" adequately explored in our attempts to empower women through new and emerging technologies.

[16] While discussing the (im)possibilities for empowerment through the Internet for rural Indian women within the specific context of a community of weavers, therefore,

> who has the Internet empowered ? What has been the process of it, and how relevant is that process for say Venkatavva, a dark brown third world woman in India? Venkatavva in Adilabad in rural Andhra Pradesh has seen the advent of roads, cars, telephones and television in the short thirty years of her life, and understands the advantages as well disadvantages and the illusion of access they give her. In a land of faulty cables and unpredictable electrical supply, her children drink milk on the days that the bus doesn't run, because on those days the milk in the village can't be taken to the city and isn't worth money. Modern technology holds no bogies for her, she has choices that many women in the north don't have access to. On days the electricity fails she watches the traditionally performed story-telling [7] enacted in the village square instead of the distant Santa Barbara on television. As of today the quality and quantity of her available choices are based as much on the failure of technology, not its success. So would modern technology be working towards more quality and quantity in choice or less? What, then, is the process by which a Venkatavva is empowered? (Gajjala and Mamidipudi 1999, p.).

Progress Narratives and ICTs

[17] Much of the rhetoric that surrounds the phenomenon of ICTs is blindly celebratory (see for example, Benedikt 1991 and Tapscott, 1996) and conflates mere connectivity with power. The impression generated by such rhetoric is that those who are not connected are inferior and illiterate. These "largely unchallenged discourses of the metaphysics of cyberspace" (Markley, 1994) are rooted in developmentalist narratives of linear Progress, and objective Science. As Robert Markeley asserts,

> The blind spot of many critiques of virtual technologies lies in their linked rhetoric of progress as natural and inevitable, and their acceptance of the view that we are living in revolutionary times in which technology can intervene in our subjectivity in ways undreamt of prior to the late twentieth century (Markley 1994, p. 439).

[18] This blind spot prevails in many studies related to the Internet and the empowerment of women through technology. This, in spite of the fact that theoretical work by scholars like Donna Haraway (1994), Katherine Hayles (1998), Arturo Escobar (1999) and Sandra Harding (1998) provides a critique of such narratives by highlighting concerns regarding the situatedness of theory and practice.

[19] It is therefore necessary for researchers to examine the interconnections between various lived contexts while also observing how each of these lived contexts is mediated by unequal economic, social and cultural power-relations. There is indeed a need to engage in an analysis that takes into consideration all the intersections and complexities involved in "conceptualizations of identity, opposition, consciousness and voice" (Dhaliwal 1996). Class, caste, age, sexuality race, geographical location, and other yet to be named categories of difference should not be merely "added-on" in such analyses.

[20] During our continuing dialogic investigations (see Gajjala and Mamidipudi 1999, 2002a, 2002b), both of us began to understand how cultural and economic activities are mutually shaped, and how technologies are designed contextually. So, for instance, while the Internet and the virtual communities and ways of being online tend to be shaped by modes of interaction and economic activities mainly centered around Anglo-American and European cultures, the weaver communities, their everyday practices and their habitats tend to be shaped by the primary economic and cultural practices surrounding the production of handloom fabrics and related products specific to their location. For instance, in the following excerpt from Annapurna Mamidipudi's description of the weaver's work spaces it is possible to see how, in this rural area, the kind of spatial design necessary within such a technological environment is shaped to include both men and women as productive members of the community's economic activities. Women are in no way excluded from the activity of weaving, nor are they shut away in private spaces delegated to nurturing tasks alone that would implicitly prevent them from being decision-makers in relation to decision-making processes central to the community of production. She writes:

> The weavers of Gangannapadu - a little village off Srikakulam district in Andhrapradesh, India live in little thatched houses. Most of the year it is very hot and humid here, and during the rains it is vulnerable to the heavy storms whipping up the coast of the Bay of Bengal. This was a group of weavers who had worked out efficient marketing systems for themselves. They used reject yarn from mills which they got at lower rates in the whole sale markets of the nearby town, and used their particular skill to weave fabric that sold as the elite 'khadi', or fabric made of handspun yarn.

> The houses are set in straight lines to enable families to use the length of the street to lay the warps, the twenty five metre long yarn lengths that formed the basic structure for weaving. The houses had looked impractical, with their slanting roofs almost reaching the ground, like veils drawn over the houses in the front, one had to bend double to see into the house. But on making the effort one could see the sense of the low slanting roof. The weaver sat at ground level in the very front room, on a loom that was laid flat on the ground, with a pit dug to accommodate his feet and the pedals the loom needed. He could see out to the road, without distracting him from his work. If he chose he could call out and invite a passerby into his house, as Suribabu invited me, and continue working as he chatted, under the cool thatched roof. The backs of the all houses opened out into common areas, here the children and women played and talked to each other. There were community kitchens, one to every row. The women could afford not to cook, they were more valuable at the loom- there would be one old woman who had a little counter which continuously supplied hot *idlis*, *chai* and milk.

> I asked the men who were resting from their work how much they produced per day and how much they earned. 'As much as Seventy rupees a day if husband and wife are on talking terms,' a young boy said laughing. It seemed his brother was newly married and had had his first spat with his wife, so now only the man sat at the three-shuttle loom. His wife refused to weave, sitting in such close proximity with him.

[21] In examining such contexts closely, we realized that if the Internet was to be useful to them, the information available and the audiences/markets accessed via the Internet would have to be relevant to their context. Gendering in online spaces occurs differently, therefore the cybercultural spaces within which these weavers would have to engage would not only require individual and communal transformations not always empowering to these community members, they would also influence and possibly negatively disrupt the everyday power balance within the local community. The gender struggles within cybercultural spaces as they are manifested currently have no relevance to the everyday lives of the women in communities such as that described in the above excerpt. On the other hand it is possible that women in these communities face problems that are unique to their context and for which solutions cannot come from the gendering experiences within westernized communities such as those that are manifested online. Therefore can we automatically assume that mere access to the Internet will somehow enrich the lives of men and women within such communities?

[22] On the other hand upon examining media representations of what it means to be a technology related worker in magazines such as *Risk* and *Silicon India*, it is possible to see the portrayal of gendered, classed and raced images within urban transnationalized work-spaces.

[23] For instance, upon examining examples of "multicultural" images and discourses found in advertisements within some magazines (such as Risk and Silicon India) that provide the latest information for international digital workers and for corporate management units, it is possible to see implicit and explicit portrayals of ideal transnational technology labor. For example, on an examination of images from Risk magazine, July 2000 we see that, while a majority of the images and profiles alongside articles in the magazine are white male, the magazine does carry a limited number of "whitened" and/or "appropriately subordinate" images of women and non-white males. In advertisements within the magazine, images invested with corporate authority are all white male. White female images and non-white male images appear in "Othered" forms and there are no images at all of coloured women in this particular issue. Below, I cite some examples to illustrate my point:

i. Image of a woman in an "imagine software inc" advertisement «www.imagine-sw.com» a Donna Reed-ish white woman. Text reads:

> IMAGINE.
> Unlike your mother, it really does know everything.
> With all due respect to almighty Mom, the Imagine Trading System is the ultimate authority.

Thus the woman's expertise is discounted through (re)placing it into a domestic context which is portrayed negatively within a discourse of nagging wife and mother.

ii. Image of Sikh (Sardarji) in an Acumen advertisement, a traditionally dressed Sikh in meditation, robot-like. Parts of his anatomy are labeled with comments. For example, an arrow pointing to the Sardarji's chest reads "Barrel-chested and bursting with personality". Text of the advertisment reads:

> The Acumen generation.
> The perfect trader's anatomy.

iii. Image of Buddhist (Asian) Monk seated in meditation (similar to the Sikh). Text reads:

> A trader using Acumen
> When it comes to risk management, using Acumen is the way to peace of mind.

In these three images, among other things, we see an exoticising of the non-anglicized male at the same time as there is an invoking of obedient colonial subjects from the East.

[24] These and other gendered, raced and classed images give us an indication of implicit and explicit socio-cultural hierarchies within transnational urban work spaces shaped by the ICT related technology work.

Constructs of Identity and Ignorance

[25] "Ignorance" and "knowledge" are constructed relative to specific socio-cultural contexts, within various power-fields. Most non-western regions are in the state they are because, historically, their cultural identities, belief-systems, as well as social and economic structures were eroded and stripped away. For example, during the British rule, traditional modes of production in India were forcefully replaced by industrial mass production which was more beneficial to the British economy than to the people in the India sub-continent. In the new industrial mass production era the traditional products lost markets and the traditional producers their confidence. The resulting outmoding of traditional forms of community and production under the ideological cover of western progress, led to a loss of self amongst local producers. People with expert knowledge of local modes of production were declared "ignorant." In the presence of Enlightenment from the West, several non-western modes of thought and life were implicitly and explicitly constructed as "backward," "traditional" and "ignorant." The peoples of these regions were thus de-empowered. Verhelst suggests that the nature of under-development in this context is a stripping away of identity

which leaves people without the capability of self-determination (Verhelst, 1990). Within this context, how can the Internet and other digital technologies be used to re-empower people in "third-world" de-empowered contexts whether they are located geographically in the West or the East? Even as the Internet and digital world construct many as "ignorant" yet again, can we possibly use these tools for re-empowerment?

[26] What would be the use of "access" to online spaces and "literacies" that allowed the weavers to build virtual communities and e-commerce sites without a larger socio-cultural environment that created virtual and real spaces for them to inhabit on there own terms? How empowering is a space that once again reduces the weavers to a position of begging within a larger "global" market that privileges the very systems of production that were responsible for their disempowerment?

[27] Our intention in selecting a describing the above scenario is not to romanticize gender relations in rural weaver communities, but to point to the fact that gender relations in any community emerge out of daily practices associated with economic production, cultural activities, local histories and various other factors including the impact of processes of globalization, nation-formation as well as histories of colonialism which shape the power-structures within specific contexts in various ways. Thus, the gendering within the weaver communities and the exercise of power, whether class-based, caste-based, age-based, religion-based or based in any other configuration of classificatory grids, works differently from the gendering that takes place, for instance, in a university or high school classroom in a mid-western town in the United States or even in urban spaces in developing countries such as India.

Conclusion

[28] In light of all the complexities and contradictions associated with designing and inhabiting women-centered technological practices and women-centered e-spaces, how might we proceed with the task of producing ICT related environments that are empowering and enabling for much of the underprivileged population of the world? Our intention, in this paper, is to lay these out as issues and questions that we must engage in-depth if we are to find real solutions to the problems of gender and other forms of inequity in relation to ICTs within our increasingly global world. We cannot limit our questions to mere access to technologies and technological environments as currently designed and structured, but we must delve into multiply mediated and specific contexts in order to gain an understanding of how we might be able to re-design for the empowerment of the less privileged of the world.

Notes

[1] Both authors thank Annapurna's newborn baby for allowing her to work on this article at such short notice.

[2] By communities of production, we simply mean communities and cultural practices that shape and are in turn shaped by the production processes that communities engage in for instance in the case of weaver communities, their everyday life is shaped through the processes by which they produce their both shape and are shaped by their everyday cultural practices. Further, in the case of computer programmers traveling from places like India to the US, their cultural practices are shaped and in turn influence work practices within communities that they work with and for.

[3] Is it a kitchen in a studio apartment in the United States or a kitchen in a remote rural village in India , are the walls plastered with pink wall paper or with mud and cow dung , does the kitchen smell of commercial brand-name cleaning products and air-fresheners or does it smell of firewood smoke and cow dung cake fuel.

[4] Please bear with me, this example does have a point.

[5] See for instance U.S. sitcoms such as "Everybody Loves Raymond."

[6] Individual women shaped through various histories of class, race and access to other forms of cultural and material capital.

[7] A form of traditional story-telling performance in South India known as "burrakatha"

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