

X_MSG: UNFOLDING HISTORIES OF SEX WORK AND SOFTWARE INTO INVISIBLE ACTIVIST MACHINERY

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Media Ecologies: Some Contested Channels of Infection

In the UK, sex workers are nomads, moving from flat to flat, from area to area, and from city to city. A worker might stay for three months or less before moving on to another location in order to keep up with the demands of the commercial market. The majority of sex workers in indoor prostitution in London are migrants who normally intend to stay for two to three years. The market structure of sex provision pits most women as individual sellers in competition with one another. Like many areas of work, working together as a co-operative tends to be the exception and not the rule. The legal restrictions that come with working in the sex industry are such that they compromise the ability of sex workers to operate safely; for instance, it is illegal for two women to work together in the same flat, despite the obvious protection this affords them.

A number of projects operate in this context, offering support to those working in the sex industry. Some, like the Open Doors drop-in centres in Hackney, London, are a part of the National Health Service. Some receive funds through other state and interstate instruments; TAMPEP, a project that produces health leaflets for sex workers, is financed under a public health initiative by the EU. Others are sustained through charitable donations and philanthropic foundations. A great deal of this energy is focussed on maintaining the sexual health of the sex worker. In 2009, a user-led and politically engaged sex-work project in Edinburgh had much of its funding withdrawn because NHS Lothian deemed female sex workers to no longer present a substantial risk of HIV transmission.

In this twenty-first century funding scenario, traces of a historical discourse around the dangerous sex worker body persist. It is a discourse framing and guarding this specific body as a site for the transmission of biological and social infection. Managing the risks of transmission that the body of the worker presents becomes an overriding concern for the contemporary welfare state and its organisation in order to practice its discipline.

There are numerous barriers for the subjects of the discourse around the sex-worker body: health, money, safety, and language. Most women working in the sex industry

speak limited English, which not only prevents them from negotiating with clients but also presents a barrier to organising in their own interest. x:talk, a sex worker-led co-operative (www.xtalkproject.net) is a self-organised group that develops services in favour of sex workers. They provide English language lessons for migrant workers in the sex industry, take part in feminist and anti-racist initiatives, and campaign for the rights of sex workers in local, national, and international contexts. Ultimately, they use language and communication as a tool for creating change and empowerment. For the past nine months, we have worked with x:talk to build a telephony-based social software system for women in the sex industry.

In our practice, we tinker and play with technology, from commercial services and systems to open-source software and free-media hardware. We intervene in sex workers' unrecognised media ecologies as well as media initiatives from the UK government targeting the weakest in society. Mostly, we try to think about things from the wrong end of the line. We attempt to speculate who and what might govern and maintain the visibility and rights of sex workers by unlocking material media systems through a multitude of technical, social, political, and gendered origins. This paper seeks to unfold the questions raised by our research project, *X_MSG* by using three different modes of writing to allow speculative historical, technical, and health-political stories to intersect, produce new questions, and bring overlooked culturotechnical processes to the fore.

Invisible Software Machines: Rethinking Historical Materialities

The processes *she* led go unrecognised as politics. She transformed the telephone — reserved for office messages of the utmost importance—into a social medium by only chattering into it. She kept channels of communication open by introducing bedsides as a key machine for switching on and off communication. However, these strategies are still predominantly regarded as trivial, repetitive, and abundant activities, hence they have been socially invisible. How does this social invisibility manufacture safety and control for women living under the radar and how are these strategies reproduced outside the spectrum of the conventionally 'visible'? Sex-work technologies, telecommunication technologies, and software technologies intersect in a web of manufactured control through media systems and thereby integrate the operations of telephony switchboards, telephones, software, looms, and other networked ecologies. They were indeed systems inhibiting the complete displacement of margins and social hierarchy, while in fact infectious media were appearing everywhere around her, though recognised nowhere.

Ada Lovelace articulated the first abstract conception of the software machine in the nineteenth century at the same time that the prostitute-bed ecologies comprised a growing infrastructure for circulation of confidential communication in an overpopulated Victorian London. "Women came to mediate exchange. Communication flows through them,

graphically or otherwise enhanced; information travelling along class lines collocates in them; the mechanism of mass cultural transfer of libidinal, commodity-desire are set-up with 'woman' as the switch point" (Wicke in Hayles, 2005, p.83). In the same way that the technical and social spaces of the switching centres and warehouses have remained largely unexplored as cultural sites of female technologies, software's role in contemporary telecommunication systems has been largely unexplored relative to power production and maintenance. Software is literally the contemporary telephony switchboard operator allowing or denying access by the binary structure of on/off, hole/no hole, zero/one in networks of text messages, conversations, binary files, and red lights. Inevitably, this switch position of the operator, sex worker, and software, is pointing to an unrecognised practice of power. Software and sex workers inhabit this space at once, kept in the dark, in order to disguise the potential and danger of the operations and functions they perform. They are heavily regulated legally and socially through mythical, biological, and political tales about their opposite.

Infections are passed through systems of sexual fluids, secret couplings of machine and woman, free-flowing lovemaking, and bastard productions forming the indecent repopulation of the world. On December 10th, 1815, Anne Isabella Milbanke gave birth to the English poet Lord Byron's daughter, Ada Lovelace. Regardless of whether Byron and Milbanke's relationship meaningfully differed from those generated by Byron's philosophy of free love and recursive polygamy, the conception of their daughter bore witness to an infection of chaos, desire, and love that Byron passed on to his aristocratic wife. It was not long before Milbanke regained control and cut all connections with Byron, leaving Lovelace to be raised in a Victorian single-parent family.

The amateur mathematician Lovelace became a switch point for histories of infection, poetical science, single mothers, and futuristic software machines. Through this circuit ran unfolding strategies for the regulation of bastardism and the transmission of free love represented by Byron; the social risks that sex workers today expose; and the normative histories that displace women from technical machines and technologies.

Lovelace dreamed of making mechanical flying machines, but in her 1843 annotations of Charles Babbage's Analytical Engine, allegedly the first computer in the world, her interest in automation instead led to the first articulation of software machines as we understand them today. She created a discourse of poetical science to engender the conceptual and material zero/one machines layered in history, boding the processes of contemporary software machines. While sex workers' bodies are controlled by the social and material ecologies of stigma, criminalising laws, exploitive employers, and hostile immigration—software is often held hostage by the history of a culturally-specific technical production invented in the 1960s and 70s by military laboratories, male computer scientists, and amateur enthusiasts. However, while the thinking behind software was conceptualised by Lovelace in 1843, the production that anticipated software

in communication networks came into being through the cyborg practice of operating the telephony switchboard, interlacing and coordinating telephone calls between caller and receiver. Notably, software based on networked environments, such as X_MSG, relies on the binary operation of interlinking and coordinating data that structures the network. Women operated the majority of calls in the UK in the 1970s, but when Queen Elizabeth on December 5th, 1958, made the historic call from Bristol to Edinburgh with the first subscriber trunk dialling (STD) connection, the cyborg practice of the operator proceeded to fold into the future software machines of telecommunication.

The female is inevitably at the nexus of these machines as well as the software embedded in this social history. As this information emerges from these social environments, it increasingly brings into question the boundaries of technology and exposes the untold histories it engages. It is this questioning of boundaries that led to the creation of the X_MSG telephony software. We are not so much interested in the technical software itself, or in an assemblage of software and hardware; rather, we focus on the questions produced from this socio-technical coupling, which help us unfold the social and technical materialities between sex workers, software, telephony switchboards, red lights, and health institutions.

A Free Media Text Message Server: Exploiting Commercial Services and Reinventing the Phone

The social software platform we developed is a many-to-many text message server, which is capable of redirecting texts to networks of members for the price of a single message.

The system operates through an inexpensive DIY telephony server. It uses a second-hand mobile phone with an 'unlimited' texts contract, radically reducing the charges for operating the system when compared with commercial services. This phone is connected through a USB cable to a recycled computer that operates the server. The value goes beyond cost; in using familiar personal mobile technology, the hardware set-up operates two processes. The first is demystification—the technology is accessible, it encourages tinkering and reprises (albeit in a limited sense) the role of the switchboard operator for the women who use and maintain it. The second, by contrast, is one of subversive performance: it enacts the breaking down of technological norms by rewiring tangible everyday hardware to create new forms.

This software assemblage, developed in consultation with x:talk, is coded to behave according to the following four social premises: each individual is anonymous, even without having a username; anyone with the telephone number for the system can create a new network, networks can be localised for different language groups; and, barring the system operator, no one can see what other networks exist.

The software design's foundation is based on the specific social norms and conditions encountered and created by sex workers within London. This serves to maximise the software's social scalability within the context of the sex industry, without reference to other contexts and uses. Scalability normally refers to how well a piece of soft/hardware functions when the volume or scale of a piece of soft/hardware is increased, however social scalability here is a measure of the ability of the software to deploy itself effectively in the greatest number of social contexts. So while the X_MSG software is at present primarily used for the internal organisation of the x:talk group, its design already contains the potential for the creation of other networks in the sex industry. For instance, the complete anonymity of users found on the network may not be an obvious match with the context of the activist group, where most members would know each other on a first name basis, but it is a crucial feature in the wider context of the sex industry. This relates to the very real fear of exposure among sex workers, especially to their family and friends in their country of origin. Likewise, the core membership of x:talk can speak English and had no real need for the language features, but this is not the case within the sex industry at large, where the workers in the UK are predominantly migrants with limited English language skills. The software has the potential to build upon the real and latent bonds between members of a language group and add a layer of language barriers against unwanted intruders on the network.

Inside the computer is an assemblage of available free software applications and home-crafted amateur coding. First are the applications Gnokii (<http://www.gnokii.org>) and Gammu (<http://wammu.eu/>), free software/open source mobile telephony applications designed to enable PCs to interact with and control mobile phones. They make closed-off mobile phone functions programmable once again. Next is the MySQL database that stores telephone numbers and distribution lists in a many-to-many relation, allowing unlimited communication structures to be formed. These applications interact through the X_MSG software, which was created in Perl, a flexible programming language that can coordinate the data exchange between different applications, allowing them to act together.

Figure one represents the interlinking performed by Perl as a flow through the mobile phone to the database and back again. Properly speaking, this is a fiction. Control of the program passes up and down levels of the software assemblage, forming a triangle with the control loop at the very top. However, it serves as a useful metaphor, making clear each component's function and placing it in proximity of the components with which it interacts. In a sense, this is the system seen from the point of view of the text message.

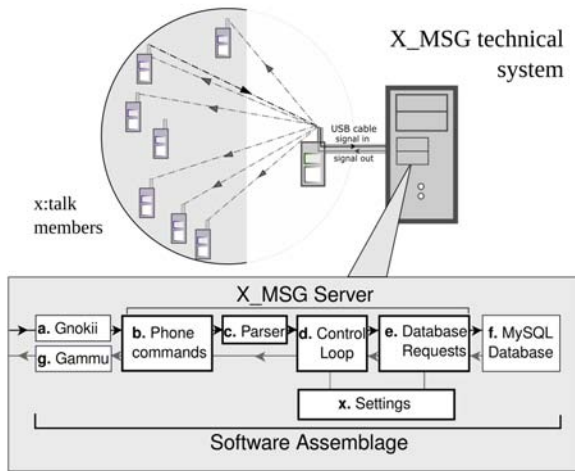


figure 1: One possible conceptualisation of the X_MSG system.

When a message is received by X_MSG's mobile phone, it is picked up through Gnokii (a.), a free software/open source mobile telephony application designed to enable PCs to interact with and control mobile phones. The X_MSG server itself is a set of scripts written in the programming language Perl (<http://www.perl.org/>). The Phone Command script (b.) provides tools to utilise and control the Gnokii application as well as Gammu (g.), a related application that is used for sending messages back out. This is, in turn, controlled by the Control Loop script (d.), which uses the Phone Command script to retrieve messages and passes them to the Parser script (c.). The Parser identifies user commands, telephone numbers, and the messages themselves from the stream of text data. Based on this information, the Control Loop uses the tools provided by the Database Requests script (e.) to update and retrieve data from the MySQL Database. (f.) This database contains three tables of data: a table of members' numbers, a table of networks, and a table that connects members to networks. The Control Loop uses the retrieved data, for example, a list of numbers for a network, to issue instructions to the Phone Command script to send out messages through Gammu. The functions of the Parser, Control Loop, and Database Requests operate under the system's Settings module (x.), which configures the connection to the MySQL database and all of the language features of the system.

The intention behind the software design is two-fold: to delineate the boundaries of the technology; and to challenge the structures within technologies that privilege the Western (Anglo-Saxon) knowledge-worker over other possible users. For instance, the commercial text messaging services we experiment with have no support for accented and special characters used in many languages utilising the Latin alphabet. When placed

within a communication system, this software application would arguably embody a hierarchy of language, with English being the ‘default’ or ‘natural’, and all others semi-supported aberrations. A single line in the Settings script of our software—*use encoding "utf8"*—removes this. Before this discovery, accented characters could even crash our software entirely. Automated messages (such as the message you receive when you make a mistake, or join a network) are available in Polish, Portuguese, French, Spanish, Russian, and English, which can be set for specific networks or individual users. The value of this feature in terms of pure utility is limited, as automated messages form a limited part of communication traffic within the systems. However, the attention paid here ensures that the system does not simply rearticulate the hierarchy we sought to remove. It means that the users of the network can configure their network to be specifically for them. This development process is by no means over. The system’s dependence on the closed system of the mobile phone network may reveal certain boundaries that cannot be overcome, but may nonetheless be exposed. Identifying these boundaries is of crucial importance to our research.

It was, in fact, a challenge to make a system that operated on a many-to-many basis. Phones (including mobile phones) are primarily geared to one-to-one communication and the commercial services around them are similarly configured. The networks the phone creates, of course, are anything but one-to-one. This is made clear in Mongrel’s *Telephone Trottoire* (<http://www.mongrel.org.uk/trottoire>), which employs a ‘pass the parcel’ method for distributing voice messages. This project, along with Jean Demar’s *FreeMob* telephony project, were important forebearers of the system. What the X_MSG software brings is consistency and, more importantly, speed to existing communication practices. This is not just a conceptual understanding, rather it is true on the level of hardware, operating as it does on a single mobile phone that can send messages only one at a time. For the end user, this acceleration is transformative. When users are separated geographically, there is no indication that the messages are sent out sequentially rather than simultaneously. The system is then both old and new, or rather one potential form which was always present within the SMS framework. Curiously, a primary use of the system for x:talk has become interconnecting existing communication structures such as meetings, lessons, and email lists, with messages directing attention to sources of critical information. In linking together these structures, the system parallels the Perl programming language that binds together other software components.

In other respects, the X_MSG system takes advantage of the values and forms built into and around telecommunication and computer technology. By operating precisely at the level of a personal mobile number, it easily falls into the social norms and restrictions surrounding mobile phones and becomes accessible only through networks of trust. A key principle of our original system design—that each user can create his or her own communication network on the system, which others can join—stems from the structure

of the relational MySQL database where this information is stored. It is accurate to attribute the creation of the network creation feature of the system to the many-to-many form of the relational database, rather than our own innovation, x:talk's input, or the structure of the sex industry at large.

The software uses a simple protocol whereby users can contact different networks by inserting a special symbol and the network name at the beginning of the message. The user creates a new network simply by attempting to contact a network that does not exist yet. Moreover, the users are not able to gain an overview of the present networks—like the mobile phone number, this information is passed on informally. This set-up allows for the creation of free-form communication structures within the database, with different possible message channels that users might not be fully aware of, and the possibility of the accidental creation of new links through common misspellings of existing networks. It thus adds indeterminacy to the system by allowing for the creation of new and unexpected channels of communication splitting off from the agreed upon structures.

Material Enclosures: Strategic Telephony and Herstorical Unfoldings

In the conjunction between the social and the technical, it makes little sense to place the software components in a fixed hierarchy, as changes in any part can be transformative. Nevertheless, the control loop in the X_MSG software can still be conceived of as the mother algorithm of the program, administrating where the text message can go and how it is passed through the system. This is not only pure mathematical data, but also a complex process of algorithmic interlacing of text message content, mathematical functions, and social organisation shaping between x:talkers. In the same way, the social organisation between women and machines in the switchboard station has individual transformative power, the complete operation of all calls is directed by a main protocol for the whole station. Software, which positions itself as an interface to social relations such as the X_MSG software or the telephony switchboard centre, is hence in constant negotiation between the mother algorithm and the user behaviours. In this sense, the programming language Perl is not only a mathematical language, but also a social organiser between the incoming and outgoing text messages and the underlying technology. It glues the distinct technologies and components together into an automated system that, crucially, facilitates the social operations between the members of x:talk. Hence, the X_MSG software aims to replace the coding aesthetics of efficiency, elegance, and functionality with an exploration of social aesthetics springing from the relations and communal exchange between the programmer and the user. This has made it possible for us to tap into an existing informal organisation mode in the x:talk group that relies on a need to send out alerts, re-plan meetings, send reminders, and so on. Likewise, the software utilises what is already present in its environment, rewiring the organisational

mode it finds into a new technology. This is an attempt to subvert technologies by unlocking their potential in experimentation. In addition, the software assists the communication and activism of the x:talk collective, integrating our system into those strategies that seek to unlock and shift positions of power.

This software plugs directly into histories where women occur as a medium of exchange or switch point, and through this process technologies are exposed in a new manner. The sex worker is no longer the secluded, stigmatised body, but a potential switch of power in a socially and materially organised system, literally administering streams of information while embodying historical channels of chaotic social and biological infection. However, it also casts a new light on government health politics and the increasing surveillance and criminalisation of sex workers' bodies, provoking us to interrogate the discourses haunting and controlling people who embody the channelling of sexual fluids, free love, social infections and with that, the potential of the new.

As a child of Lord Byron, Lovelace also became a bearer of this infected history. She became the switch to turn on and off histories interlacing the operations of zero/one machines as she described the data processes performed by the Analytical Engine as beautiful, abstract, and peculiar as the advanced woven patterns of the loom. In fact, she articulated the networked fabrications of the loom as highly advanced data storing processes, completely enmeshed in secretive female culture. But secrecy and invisibility have always been directives for female cultures of knowledge, as much celebrated within cultures as exploited by histories of technology. Literally, women occupied the position of power—plugging in and out everything from international corporate calls to secret calls between lover and housewife—controlling the switching board in order to coordinate the networks of conversations embodied in these machines. Her position has, however, been largely under explored as a part of the history of technology and a precursor for software-based models of data networking.

This gives us a great opportunity to disregard any order and chronology in these histories and look only at the unlikely points where they nevertheless collide. Returning to the questions of invisibility, when faced with the technical story of interlacing data with programs such as Perl, MySQL, and mobile telephony software, many respond with indifference simply because the language is not saturated with cultural meaning, as opposed to the sex worker body. These data processes in software are deeply layered in a history of cyborg practices and, hence, they hold the potential for interventions that will bypass channels of power and surveillance.

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