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Global Smart Spaces

Raw Observation in the strict sense of the
word/Early interaction design concepts from
fieldwork

(Raw observation data on spatial usage)

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Abstract (for dissemination)	This document reports on observation data from fieldwork done for GLOSS. It also reports new and additional work on design concepts arising from the fieldwork. This has been accorded new deliverable number as it is in addition to the fieldwork.					
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*It's my lunch hour, so I go
for a walk among the bum-colored
cabs.*

Frank O'Hara: *A step away from them*

Sous les pavés, la plage! (Beneath the paving stones, the beach!)

Situationist slogan

Tongs Ya Bass!

Glasgow gang graffiti

If you cling to Nature, to the simple in Nature, to the little things that hardly anyone sees, and that can so unexpectedly become big and beyond measuring; if you have this love of inconsiderable things and seek quite simply, as one who serves, to win the confidence of what seems poor; then everything will become easier, more coherent and somehow more conciliatory for you, not in your intellect, perhaps, which lags marveling behind, but in your inmost consciousness, waking and cognizance.

Rainer Maria Rilke



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1 Introduction

This document is a report on initial data on spatial usage generated by ethnographic fieldwork in a number of European cities. It is thus an *interim* report which will describe the method and focus of the work, and then go on to discuss some emerging themes from the fieldwork which might be useful for the project. The fieldwork will feed into other deliverables such as D 10, D 12, and D18 and will inform design of the smart spaces and whatever personal awareness technology is developed in the course of the project. It may also point to possibilities for future work outside the project.

1.1 Focus

Early in the Gloss project, a scenario was generated with two purposes:

1. The scenario proved a useful first step in envisioning how smart spaces could be used
2. The scenario could help with the development of a number of demonstrators for smart spaces- and the underlying infrastructure of smart spaces.

This scenario is presented in two documents. It comprises an appendix to Gloss deliverable D4 “Interaction Archetypes”. It is also presented as a visual document in a Gloss internal document which is enclosed here. This was created by the Gloss partners at UJF in Grenoble.

The scenario concerns a businessman’s trip from Brussels to Paris, and the various opportunities for action which a set of Global smart spaces (GLOSSs), devices, applications and services might offer to this user. As such the scenario is a visionary document, not based on current realities.

The fieldwork takes the scenario as a *point of departure*. The scenario is useful as a ‘first step’ in a number of ways. It is useful because it *delimits the focus* of the Gloss smart space and user experience. That is, in a project concerning “Global smart spaces” it is useful to have some limit to the territory one might want to investigate.

The focus of this project is rather different from the norm. Because it concerns the possibility of moving seamlessly through physical space and picking up contextually appropriate information, it does not have the natural limits more readily present, say, in a CSCW application such as video conferencing, or a Collaborative Virtual Environment (CVE) (e.g. Churchill, et al 2001). There the focus is much more obvious: the work which might be supported by video conferencing or in a CVE and the study of the work and encounters within these environments. Global smart spaces by their nature might cover and support a whole range of activities and a whole range of modes of activity, both indoors, and out, work, domestic, leisure, whatever.

Fieldwork of every aspect of the lived everyday world is perhaps a little ambitious to focus on at first. The scenario helps to map out a set of activities and environments to explore, as bounded parts of everyday experience. This scenario also outlines activities which include both work, travel and free time. Thus it gives a first early idea of some useful activities to focus on in the fieldwork. In return, the fieldwork also serves as somewhat of a *reality check* to the scenario. It has the potential to provide questions and raise issues which the scenario, by its nature, will not. It can get into the ‘grit’ of the environment or activity, get beyond people’s accounts of what they do and get a fine grain idea of activities and competencies which might be interesting.

Global smart spaces and the devices which are incorporated under this rubric have to exist in an everyday world, of such things as traffic jams, muggers, lousy transport infrastructures (such as in most of the UK) and the like. It is useful for some ‘grit’ to enter the project’s focus. A more realistic scenario or set of scenarios can be very beneficial to the project, providing inspiration and design opportunities which may not have been conceived outside the fieldwork.

1.2 Purpose of this document

This document is an initial report on the observation data, which is in two forms; video footage and ethnographic fieldwork. It is *by no means* a final analysis of this data, but simply a report of the themes which are beginning to emerge from the data. This fieldwork will feed into a number of deliverables and reports further on in the project, such as D 10 in PM 27- “Analysis of Experiences”, and D18 “Initial Design of Interaction Techniques Using Multiple Interaction Surfaces”, in PM 30.

It will play a part in informing the design of both the smart spaces, as well as the services and awareness engines with which the user might be equipped in order to interact with the smart spaces. It will perhaps also point to design possibilities outside this project, such as possibilities for further work and services which are well outside the scope of the project.

2 Method

The methodological leaning of this work is ethnography, informed by theory from anthropology and sociology, significantly but not exclusively from an ethnomethodological leaning. However, the work also is informed by from social geography, and architecture.

The main corpus of data for this study was taken in a concentrated period of fieldwork which took place principally in Paris, Brussels and Amsterdam. 8 hours of DV tape were shot. In addition to this, observations were made, contributing to ethnographic fieldnotes.

The author has reasonable amount of experience in this kind of analysis, having helped pioneer its use for requirements analysis and generation at the Centre for Requirements and Foundations, Oxford University Computing Laboratory, and its use in a number of domains since.

The purpose of the video data is three-fold, for this kind of ethnography:-

1. It is useful for a kind of video 'note-taking', where particularly interesting scenes are chosen and recorded, as an aide-memoire for further analysis later. This sees video tape as one of a number of things which make up the 'bricolage' of ethnographic analysis, such as official materials of various sorts, interviews, field-notes, photography.
2. Because video is finer grain, more detailed analysis can be done in a more micro-structural way. Segments can be recorded and gone over again and again, enabling the revealing of the micro-elements of encounters, the fine interleaving of behaviour, etc.
3. Video tape is useful in a whole other way. It can help show an audience what one sees, and help take people through an analysis. In particular, for this study, it can help generate still vignettes of particularly interesting segments.

Ethnographic fieldwork in the domain of Computer Science/ Interaction Design is usually done with a purpose in mind, other than the simple revealing of the day-to-day realities of those people or places studied, (so helping to reveal more about issues of culture, social order and the like). It is usually done to help to generate requirements for systems to support particular activities or behaviours, or help to inform thinking of the general *design space* that the device must inhabit (maybe that it must be hand-held, or that it must be portable, etc.)

Of course, the impact of the fieldwork can be, and usually is, diffuse. It can be part of a dialogue with designers and builders of devices, from high level, such as interface, to informing at a product design level, down even to quite low levels of system design. It is possible that findings from fieldwork can suggest possible changes at a low, even an algorithmic level. For example, work the author did funded by BT in the UK indicated that in their video conferencing system, the compression algorithm was interfering with the meetings done there. Any time there was great movement, the sound cut out as the system worked to process the amount of change in the video part of the signal. That work showed how the people in the study of the system 'oriented' to the algorithm, and avoided sudden change. This and other evidence suggested that one of the requirements was for a 'ringfenced' audio channel rather than faithful recording of movement. Other needs were for variable video compression rates, and so on.

The purpose of fieldwork is not that its findings should be slavishly adhered to, but rather is part of a dialogue from a number of different groups who are all part of the design process. It is important to understand that ethnographic fieldwork has the potential to uncover more than the practices of a group, or culture, and the way they perform various activities. It can, moreover, crucially shed light on those practices in terms of their part in an ongoing, unfolding ecology of behaviour.

2.1.1 *The sites studied*

The fieldwork was carried out in a number of European cities. Brussels and Paris were the original focus, largely because a trip from Brussels to Paris was the focus of the original scenario document (appendix, D4). Incorporating Amsterdam into the fieldwork, gave a completely different city topography, and also a completely different focus as regards transportation; with car use, while not illegal, frowned upon. So it is both a public transport-rich city but also one where 'alternative' modes of transport (i.e. Cycles) are the norm. Further initial fieldwork was done in London, Glasgow, Bologna, and Firenze.

As said, the fieldwork followed roughly the original scenario of a person travelling from one city to another, maybe to meet someone for a business meeting. However, at the first instance, a number of deviations were made. The trips to Amsterdam, Paris and Brussels were for a number of days in each case, rather than there and back in an afternoon. This gives us a number of further things to investigate: opportunities for finding hotels, places to meet, and generally short-term *dwelling* in the city. It also makes the experience rather different from that of a short term visitor, and can more incorporate multiple modes of interaction with the city.

3 The [current] fieldwork corpus

The raw data exists on DV (Digital Video) footage taken in the following locations. I will list *very briefly* the kinds of activities which the DV tapes comprise, but this is by no means exhaustive. It must be remembered that the corpus of video data is only half the data available. Ethnographic fieldnotes also exist. These two sources of data, as well as the usual ethnographic 'bricolage' of official documents, written artefacts, stills, etc, will all contribute to the final analysis.

3.1 Current video footage

I will outline some of the activities observed in each site.

3.1.1 *Amsterdam*

Mix of local commuting, walking around the city, commuting for a train, hotel reservation, activity at the station etc, Embarkation on Sneltrain to Brussels, ticket collection, activity in different parts of the city, from popular tourist locations to less popular.

3.1.2 *Brussels*

Metro usage, walking about the city, activity around the main square, activity around various monuments and tourist spots, commuting to hotel, interaction around hotel, activity around Centraal and Brussel Zuid/Bruxelles Midi, ticket collection and booking, embarking on Thaly to Paris.

3.1.3 *Paris*

Arriving on Thaly, metro trips, walking around the city, activity in a variety of locations, activity around stations, hotel check-in. Cafes, different locations in the city. Activity in the station, use of space in the station.

3.1.4 *Glasgow*

General commuting around town, activity around public areas. It is intended that more will be collected in this city in the near future.

3.2 Future additions to the corpus

Future additions will involve:-

3.2.1 *Glasgow*

More work looking at fine-grain interaction in a variety of spaces. This will include popular spaces to 'hang out', local transportation, car transportation, express trips. Work will also be done to pioneer the use of video and GPS linking which should give valuable scenario/location information which will be useful for further analysis. It is intended that this work will be done in the next couple of months.

3.2.2 *London*

The London Underground is one of the most complex underground systems in the world. The interconnections and sheer complexity of the system are interesting for a number of reasons. Further work will be done to look both at travelling in the system, and traveller's 'war stories' about travelling, as these often contain interesting local knowledge about different aspects of the Underground.

3.2.3 *Gothenborg.*

We are hoping to collect some footage of activity around the demos at the DC event. Of course the DC event will be of demonstrations of exemplars of the Gloss framework, and as such of work in progress, however it may present some interesting early experiences which may feed back into the design cycle.

4 Themes

I will go on to discuss a number of themes arising from the fieldwork. These will be reported briefly at this stage. This will help give a flavour of the current direction of the ethnographic fieldwork but *will in no way constitute a final analysis* of the fieldwork. This deliverable, then, is, by its nature, an *interim* document. The author does not apologise if this document comes across as being impressionistic and incoherent. Fieldwork is like this by its very nature and interim reports would be misleading if they came across as finished analysis. This is very much, to paraphrase the title for Malinowski's diaries, raw observation data *in the strict sense of the word*.

After this, I will go on to discuss a number of possibilities for design which are beginning to emerge.

I will both report some themes arising from the fieldwork, and allude to some possibilities emerging for Global smart spaces.

4.1 Setting out- tools and artefacts

4.1.1 The wash-bag

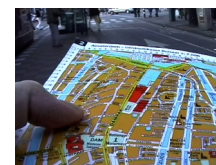
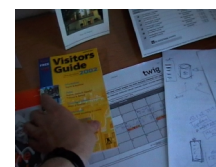
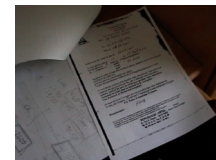
Many frequent travellers begin to develop certain groups of things which they take with them. Often, they go as far as to have some things permanently packed. They might well have small containers to take particular groups of things with them.

The wash bag is an element of this. In the case of the author, it is a bag given to him by KLM after being 'bounced' from a flight from Amsterdam to Stockholm, and given the task of staying in a hotel by the airport. It is roughly 12 inches, by 4 by 2. Washbags can contain the usual toiletries, such as toothpaste, toothbrush, deodorant, maybe small versions of body wash products, shampoo, but they might also take other things, tampons, condoms, shaver, European plug converters, etc. It might also contain painkillers. Sometimes a passport is kept in it because if the wash-bag is taken, as it always is, the passport will not be forgotten.

The wash-bag is interesting in a lot of ways; it is a mechanism for keeping a lot of unrelated things (bathroom, electrical, administrative) together because it has the *one purpose*. All these items are linked in a *framework of relevance*.

We can go further and look at other similar items- the carry-on bag contains a number of items, again a 'bricolage' of a number of often unrelated things, which are brought together for the trip. We might see 'guides' to the region or city being visited, faxes confirming reservations, notebooks with contact numbers, diaries and the like. Other things are picked up in each town one visits. Perhaps a street map is bought or taken from the information point at the airport (e.g. Stockholm Arlanda), or a street guide is bought from a newsagent's. Free guides (such as the one in Amsterdam published by, and with shameless touting for, the comedy club, 'Boom Chicago') may also be picked up.

It is interesting how these guides embody certain criteria of relevance for the visitor. It is when one compares a number that it becomes interesting. Both Amsterdam and Copenhagen guides, for instance, have quite big sections featuring escort services, saunas and 'nightclubs'. This is not true of other city guides. Each city may also have oddities not in many other cities, in Copenhagen there is a section on amber jewellery, in Reykjavík, there is a big section on woollen-wear, and 'super jeep' adventure trips. Thus the guides issued may tell us a lot about the legal, geographical, and social frameworks in which these cities operate. Each guide, then might embody a new system of categories as well as commonalities. It becomes interesting when has a



formalised set of categories (such as in something like the Rough Guides) come up against particular local oddities.

In summary,

4.2 Travelling to the station

The scenario document sees the businessman travelling to the train by car. This is one of the kinds of car usage that a lot of governments and city councils want to discourage. In the case of Amsterdam, there is good public transport and an active discouragement of cars- in fact, in the city centre, Amsterdammers might have to wait many years for an allocated parking place. Other European cities are also trying to tackle the effects of excessive car usage.

The current fieldwork has studied public transport means to come to the station, and to get around the city. I will briefly go on to discuss some themes which come to light from this study.

4.2.1 Tickets and validation

Tickets can be bought in the tram but often it is better if they are bought in multiples. In some cities (Bologna, Firenze) one is not able to buy tickets on the bus. They are normally validated in special machines on the tram. Or before the metro, often with the machine obstructing the way into the metro until a ticket has been inserted. Other systems use a validation machine on the tram or bus. Some machines validate tickets for an hour, where one can use any service for that time. This leads (Firenze) to the site of people sitting on the bus, and validating tickets only when it has started.

4.2.2 A stranger in a strange land: knowing one's stop

The important thing is if one is not a native is finding out which is the right direction in which to go- which direction for the station and which is right for the suburbs, etc.

There is also the question of knowing where to stop, which is not straightforward even if to locals it seems obvious. In a new city, cues are often slightly different- a lot of constants in one country are skewed. In Amsterdam for instance, it is quite acceptable for a woman to sit in the window and sell sex, and also be a member of a union. The 'Kammer', the booth in which she sits, is a new genre of building which does not have an equivalent. In a similar way, railway stations, post offices, chemists may look quite different. Further, there may not be the same conventions of shop- the 'brown café' in the Netherlands is not the same as a pub. Though many things stay constant, there are slight shifts of convention between countries which can disorientate.

This may mean that landmarks and 'looks' of buildings differ, so the visitor is not quite sure when they have reached their stop.

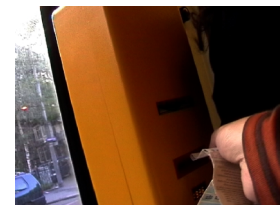
4.2.3 Physical hurdles

In the Metro the situation may be more involved- which way for the right line? How many changes does one need. An interesting issue comes on if one has at all any kind of heavy case, or if one is of any sort of special need. It would be good for the traveller to know if he or she could avoid stairs, and any other physical hurdles.

In the London Underground, not all stations, for example, are the same. It may be much more straight-forward to change at one station and not the other. Seasoned users also may do things which seem non commonsensical- such as



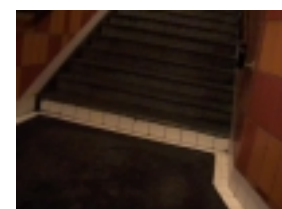
Paris metro



Validating a ticket on Amsterdam tram



Metro map in Brussels



Stairs in Paris Metro

going in the opposite direction to the one in which one is travelling in order to get onto a 'better' line' in terms of reliability, or other possible factors¹. It is also the case that some interchanges between lines are much more straightforward than others. Some interchanges involve much walking some distance and stairs.

Further work and analysis might look at this kind of issue with other groups. A person with a heavy case etc is in some ways similar to other groups, such as those with special needs.

Further work should also be done to generate realistic design scenarios for groups with special needs, especially blind, and those who are precluded from normal walking e.g. are in wheelchairs, complaints which limit fitness.

4.3 On the train

A number of themes arise here.

It is interesting to note that the scenario document notes no detail for the train journey, just that the businessman goes on to the train, presumably takes his seat, and life seems to stop. However, in real life, this is far from the case. We will discuss this very briefly, but will first note the physical makeup of the carriage. Further work will be perhaps illuminating in this field.

4.3.1 *Layout and Architecture*

The comparison with this and say the metro is illuminating. There is much more of a people-density on the Metro- it is frequently crowded, people might well be there for a long journey- the Tube in London frequently takes quite a long time, with multiple changes, but the general design of the carriages is for a short-term usage. Seats are not adjustable, are not comfortable, and there is explicit space for standing, equipped with handholds and the like. Generally, the tube does not have luggage racks, or anything where one might put one's bags 'away'. Rather, the Tube and Metro (both in Brussels and Paris) seem to expect one to use available floor space to put one's things around one. Generally, it would seem that the expectation is that people will not have very much things with them, and that what they do have can be kept with them for the relatively short journey. On the London underground, bags are generally kept by peoples' feet. There is more space at the end of carriages, but often this restricts entries and exits.

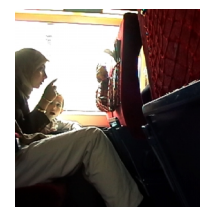


The express train, then, is different and has many places to store cases, etc. It has few standing places, and luggage is expected to be put in special racks at the end of the carriage, or above the seats. In some designs, it can be put between the seats.

Very briefly, a people do a number of things once they have actually got on the train (never mind finding their booked seat, an achievement in itself).

4.3.2 *The train journey*

Once people take their seats on the train, however, many things happen. Trains with a journey of over half an hour are usually equipped as an 'express' service (comfortable seats, space for luggage and the like). We see this in the UK with the Glasgow-Edinburgh line, in Italy with the Bologna-Firenze journey, and we see it with the Thaly (TGV express) service from e.g. Amsterdam to Brussels, and of course from Brussels to Paris. The main point here is that generally 'express' services offer some interesting opportunities: a



¹ More work on the Underground will be done later in the year.

table, places to put ones' things, and generally, the possibility for a number of modes of activity. One can work, to an extent, with mobile phone and laptop, one can enjoy the journey, have a snooze, or one can lie back. One can do puzzles, chat, sometimes make friends, flirt. It is also a place where one can blot out others through walkman, playing games, watching DVDs. Someone takes out a laptop, sits with it, mobile phone, earphones on. A train can be a place to sit and think, admire the view, take out some work, reflect a little. Further work might be done to explore travel time.



Later on in the journey the passenger checks maps, guides, finds out where he or she has to go. The passenger packs up his or her bag, puts the stuff one has been using, playing with back. They check that everything is there. There is an enormous amount of bustle when the train empties at its final destination. Bags, packages, cases being manhandled, people darting back to check that everything is there.



An interesting possibility for global smart spaces is if the train itself becomes a smart space. If people can use their time on the train as they do, but have the possibility to augment what they normally do on the train, play games, flirt and the like, but have the possibility to augment this.

The architecture of the train means that one tends to only get to know (if at all) those in seats near one. Can the narrow, functional nature of the train corridor, the seat outline etc, be electronically modified into something more like a virtual Piazza? What about the possibilities on the train of being private, of switching off one's mobile? The train is as well a place of privacy. A place to think. There seems to be the need not only for the possibility of the user not only to have the possibility of communication, but the communication to shut communication off. These topics are worthy, it seems, of further investigation.

4.3.3 Ticket queues, reprise: the discreet charm of the ticket person.

Arriving in a strange city can be disorientating. One relies on maps, guides. It is often not straightforward finding out where to go, which line on the metro or tube to go on. There are large queues at the information counter in the Metro at Gare du Nord which doubles as a ticket office. Partly, this is not just to buy tickets. The woman behind the counter speaks very good English, and can help with other queries, what kind of ticket? How long are they staying? This kind of ticket may be best.



One thought here- in the scenario, the smart space tends to 'do' things, very much as an expert system might. It almost decides for you, and replaces people such as the wine waiter, with all their experience. (See scenario document). This is very much the 'conventional expert system approach of the 80s, where systems were attempted to be built to actually replace expertise. Later it was suggested that systems might be built to augment expertise. What if the smart space and awareness device got the options, either so that they could avoid the queue, or that they could *frame the questions they wanted to ask* by the time they reached the front of the queue? The crux of the matter is this: should we focus the project on *replication*, or on *augmentation*?

4.4 Arrival

One has gone onto the underground, found the appropriate line, and purchased the appropriate ticket for the stay, maybe a carnet or maybe a three-day saver, which may incorporate such things as special deals for museum entry as well. In the case of the underground, I have outlined briefly the complexities of interchange, of getting the right journey, which may well be contra-intuitive.

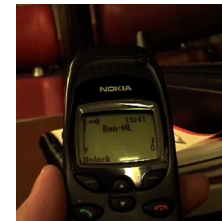


Very briefly, I now want to talk about the whole other business of arrival in a city. If it is a city one knows, one might well be visiting friends. One may well know the way, the type of ticket to buy. Other parts of the city experience come into view. If one goes often to a city, it is likely that one has more than some friends there. One may have some who one sees regularly, with whom one faces the odd situation of going from 'looking them up' when one is in the city, to the situation of it being *accountable* if one does *not* look them up.

As well as them, there may be people who one knows in the city, often people with a similar peripatetic lifestyle. One makes calls, talks to answering machines, mobiles. Listens to answering machines in Dutch, in Italian, in Swedish, one might get the gist and leave a garbled message. 'I'm in Amsterdam/Paris/Malmö- you around?'

One may arrange to meet people in favourite pubs or cafes. Find out that one has closed, or changed hands since last time, or that another is open.

Further analysis will be done in this area as it has the potential to be a fertile ground for thinking about new types of tool and awareness technologies.



4.5 Dwelling in the city: appropriation of space

I will briefly discuss a number of themes about dwelling in the city. I will talk briefly about different kinds of appropriation of space.

In the most obvious way, we see appropriation of space in Amsterdam in the physical evidence of it in the squats all around the city. The squats are often brightly painted and coloured. One sees it also through smaller scale things, such as where the bricks which make up the pavement have been removed and plants put in place. Or plants might have been put in old oil-cans or barrels to form a makeshift garden, and can contain anything from some tulips to small trees. This happens particularly in certain back-streets in residential areas.



The Vrankryk squat, and companion, Spuistraat, Amsterdam

These are some of the more obvious appropriations of space-appropriations of a whole disused building, and the maintaining appropriation in the face of civil and police action. However, there are some other phenomena which we I put under the rubric of 'appropriation' for the moment that might be interesting and worthy of further analysis.



4.5.1 Small appropriations; graffiti and modifications

A number of examples of this are interesting. In a ticket office of a Brussels metro station there is a wonderful example of what I will call, for the moment, appropriation.

The first example is a piece of paper put up in a metro window, giving directions for certain lines. Similar things were observed in the train ticket counter at Schipol airport in Amsterdam. In both cases, the most frequent questions have been answered from the sign. In the case of the Brussels sign, we see directions of how to get to the most popular tourist attractions by the Metro. In the case of the Schipol example, every ticket booth has a printed piece of paper either sellotaped by itself or put in a clear plastic envelope with the legend "Platform 3 for Amsterdam Centraal- trains every 20 minutes".



'FAQ' on Brussels Metro ticket window

In both cases they serve as an 'FAQ' service, giving answers to the most obvious questions.

There is a further, rather interesting example of an appropriation. In this case it is perhaps there to fulfil a personal need of the ticket collector. But what does it 'do' in doing this? Perhaps our experience becomes a different one, as the ticket collector has appropriated this official space for personal uses. To an extent, this is true of the examples above, but in this case the ticket collector has perhaps crossed the boundary of his job, and is acting outside any official role.



Notice on Brussels metro ticket office

However, the general experience, when one exists in so many 'non places' when travelling, is refreshing and intimate. Such appropriations are well worth future study, and will be subject to further work.

Other appropriations can be semi-corporate, in the form of 'fly-postering' which exists in an illegal-but-nothing-is-really-done-about-it way in many cities. This might advertise clubs, events, perhaps by small-time operators, but often even by big, national or international concerns. 'Guerilla marketing', which utilises fly postering and other things as techniques to get over their message in an "edgy", "street", way [sic], is now used by multinationals, often using the Samizdat techniques which were rooted in Punk and also in various freedom movements in the 60s and 70s (e.g. Czechoslovakia). Now it is becoming (or already *has* become) an accepted trope of the conventional marketer.



However, examples of the original postering of this type show many possibilities of use. It may (Glasgow, London- but a general phenomenon) advertise the fact that a family has lost their beloved pet and give a description, and a number to ring. They may also say how much the dog is beloved, is missed etc. They may offer a reward. It may be to offer for sale some item, or advertise a flat to rent, or someone looking for a flat to rent.



Previous work has been done by this author on graffiti, especially in relation to street gangs and territory. It is well worth studying further for this project. Briefly, the placement of graffiti in many instances is quite nuanced: it can be used to advertise the territory of one gang, for example the graffiti saying basically- 'this is our gang's territory'. It can also be used quite reflexively by other gangs- in that placement of graffiti in the 'territory' of that gang will symbolise a 'loss of face' of that gang. Further work will be done looking at location of graffiti and meaning, with application to the technologies being developed in Gloss.

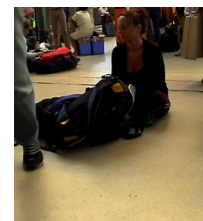


4.5.2 Appropriation of space in sitting, standing

We also see appropriations of space in small ways in the streets and squares of the city, and in other public spaces. I will describe briefly appropriation of space on the station concourse. Groups of travelers put their bags together and sit on them, or sit on the concourse propped up by their bags. Sometimes they almost create little 'enclaves' with their bags, their bodies and whatever other things they have by. These things quite often resemble a corral, and we see examples of people sitting as if around a campfire. One thing for further investigation is the particular shape of these enclaves and their relation to the various physical artefacts in the station.



The interesting thing for future analysis is exactly *where* this happens. It seems to happen in places where, if the flow around the station were of a liquid, rather than of people, that eddies might occur. The appropriation seems to occur in the lee of particular types of physical artefact, such as seats, balustrades, signs and the like. Another appropriation happens in a certain area around station information sources such as the train time indicator board, giving platform details, delays and the like. People range themselves towards it but within site, so the part below the board, where the information is at too sharp an angle to see, remains clear. This area tends to be free for walking. It seems a very good example of an information resource (in this case a physical one) being a major landscape element in physical space with concomitant effects. Further work will be done on this, most likely in conjunction with architectural work on interaction with spaces.



However, in summary it the micro-processes of the appropriation of physical space will need further analysis in this project (and projects of this nature), as we become able to manipulate the placing of virtual information resources in space. These achievements may well give us some pointers for future developments of the tools and awareness technologies in smart spaces.



5 Provisional conclusions and prospect

This document has shown and discussed a number of themes beginning to arise from the fieldwork. This work is in its early stages, but is already proving fruitful. In fact, some early design notes have been generated (below). This work is still at its early stages, and as stressed below and above, should not be taken as in any sense canonical. This deliverable, is, as I have said, by its nature an interim document. Hopefully, though, it can convey a sense of possibility and potential for more rounded work in the course of the project.

5.1 This deliverable

It is important to note that this deliverable is meant only to outline the *raw observation data*. It can be seen that the deliverable exceeds this, and in fact adds elements to the deliverable (the design notes, below) which are much in excess of it. This is why the section below is nominally called **D24**. These design notes are included below because they have arisen from the fieldwork, and prompt themes and topics to further explore in the fieldwork. As said before, not everything in this fieldwork or in the design notes will be able to be done in the lifetime of this project. It is perhaps a testament to the fascinating possibilities of this area that they may well be continued in further work.

6 Early interaction design concepts from fieldwork (D24)

This incorporates a short account of some design themes which have begun to be generated from early analysis of the fieldwork reported in D6. The design themes come in a number of forms, from modification or attenuation of the tools mentioned in deliverable D4, to new tools and possible services. These are *early* concepts and are in addition to the deliverable D6, but inspired by the work in it.

Please note that these are very much *early* design concepts, and as such should not be taken as anything other than possibilities for development. It may well be that these concepts do not reach any kind of fruition in this project, but rather reach fruition later.

6.1 The Radar attenuator

Radar is presented in D4 thus:

This tool gives the user an overview beyond the immediate environment. With this tool you will be able to locate low and high densities, crowds and groups in a larger area. Radar, then, helps one see aggregates of human activity. This can help you find the special gap of freedom, the emptiness, one sometimes lacks in a public environment. This instrument can search the streets and spaces for one on a hunt for either noise or silence.

However there is no mention of its *range*. It seems implicit in the description that the range is perhaps that of a city, or region of a city, where one finds crowded or silent areas.

Early analysis of, and reflection on, the fieldwork has inspired a concept of a tool which works alongside radar, the *attenuator*. This tool acts (like the name suggests) as an attenuator to Radar. One can turn it up and down, have greater or lesser range.

We can think of this in terms of the mathematical idea of sets. One may have the radar attenuator off and have the possibility of seeing the set 'everyone in the world' or attenuate it with the subset 'everyone within this region/country/city/area/street. This seems nonsensical at first. Radar could do nothing but give us 'booming, buzzing confusion' (to paraphrase the psychologist, Jerome Bruner). What if we add some intelligence on top of this?

What if, orthogonal to the dimension of range, we add a dimension of *people I know*, perhaps *people in my contacts book* (e.g. like the contacts book of a mobile phone). Then the range attenuation becomes interesting for different possible groups. Some of these have been briefly studied in the fieldwork so far done, but more work can be done to look at some of these possible dimensions and feedback into these design concepts.

However, sometimes we think in different granularities about those things. I will give a few examples below:-

- **Granularity of Region**

I'm in Europe- in Amsterdam- are any of my friends touring Europe? For a backpacker, those first blips might be interesting and can lead to travelling to a different European country to meet friends. Europe-wide journeys are small compared to the distance from Australia, or North America.

- **Granularity of Country**

I'm in Amsterdam- anyone else in the Netherlands that I know?

- **City**

"I've arrived in Brussels. Are any of my friends around? Goodness, what's she doing here? She turns out to be here for a meeting with Digital Libraries people. I'm here for a meeting of a network of excellence."

- **Section**

"Anyone in this group of streets?" This could be a delimited section like de Pijp or Jordaan in Amsterdam, the Marais or Left Bank in Paris. Actually, it might be synonymous with the Parisian concept of

Arrondissement. Further work might look at delineated areas and look further at urban geography ideas of territory etc.

- **Street**

“I’m in Buchanan Street- are you there yet?” “Anyone around?” This might be a quick check when one arrives in an area.

- **Place (pub, club, store etc)**

“I don’t think she’s here- I’ll check.” “Just *where* is he? I should know never to leave a gay man in soft furnishings”.

These examples are quite contrived, but hopefully they show that attenuation can be useful, especially if it is over a number of orthogonal dimensions. It would seem that, at a first pass, even quite large regions can be useful (i.e. low attenuation on one dimension) being possible if another dimension is quite restrictive. For someone with particularly peripatetic friends it may well come to the question: “where is X in the world?”

I will outline some dimensions for attenuation below and give some brief examples. This may be worthy of future study.

There are three dimensions: **Relatedness** (say- who’s in my address book etc), **Area Covered** (street/area/city/region/country) and a new dimension, **time**.

The following questions might be asked of an awareness device equipped with attenuated radar. I will divide them into the three dimensions as each has precedence and as others vary with it. We can give examples below:

When **who** is important (Relatedness)-

I want to see my friends I do not want to see strangers.

Who is in Paris at the moment? (Granularity of relatedness and of spatial coverage- time is now)

Who is available at this time? (Granularity of relatedness; no granularity of spatial coverage; time is ‘now’)

Where are my friends (Relatedness with no granularity of area covered:?)

Less granularity of relatedness (not individuals but a profiled group) and granularity of area covered:

Where with who: Where are goths in this city? Where are the skateboarders?

Granularity of relatedness (people like me, or who I want to get to know and who fit that profile) and spatial coverage. These are closely related. If a bunch of people who call themselves goths are hanging round and other people are there, they are probably also goths.

Are any of my friends in this place? (Granularity of spatial coverage combined with more granularity of relatedness).

When **where** is important:

I want to see things in this physical area or space. No more. I’m not interested in much further away. I am interested in a particular place.

When does this place get busy? Particular spatial coverage with less granularity of time.

Who’s around here? Where with who- Relatedness and particular spatial coverage

When **when** is important:

I want to see who’s available now (particular time- no granularity of place).

6.1.1 Prospect

This design concept seems to be one which can be applied in interesting ways to Radar. One issue, however, might be the sheer mutability of the three dimensions and the amount of possibilities to the user. One interaction design way round this might be to have certain questions hardwired, e.g. *who’s here now?* With the device prompting the level of granularity that the user wants.

6.2 The Flare

This is a very simple concept. Like a message flare, one sends up a flare to tell everyone one’s location. This could be modified by **relatedness**, giving it to one’s friends, a particular friend, whatever. If one is in a

crowded place, a station etc, one can get this to shine up on other peoples' awareness devices. This is an active system for the person being sensed, unlike radar, where the sensed person is essentially passive. This might also be useful in emergencies.

Generally, rather than searching with radar, one could 'send up a flare' when one has reached a destination, and it would flash on everyone's awareness device.

6.3 Visibility/invisibility- degrees of anonymity

As we have seen from the discussion of the fieldwork above, a traveler may very much want to impinge on others' consciousness through being available to their devices. She or he might also want to do more than passively be available, but might want to actively signal (the Flare). However, there may well be times when one wants, to some extent, to be invisible. It may be that one is going to a location in the city that some might frown on (e.g. the Red Light District). Basically, the awareness device as it stands could as well be a *surveillance* device.

Perhaps the user can choose different levels of visibility in certain times:

Total invisibility

Device does not give out any information. Not for general radar services, or anything.

Visibility as a "member of the public"

I can be seen, people know that there is someone there and walking about. However, that is all people know. They do not know my identity, or the person's preferences etc. We see this in traditional Muslim countries with the veil- one cannot readily identify the woman beneath the veil- only that she is a woman.

Visibility as a member of a community

You might not know my name but you can tell that I'm a Goth, a skateboarder or Gay- In the street, we would be by signifiers of dress, signifiers of makeup, of place one is in. I may not wish people to know my identity (such as let people know I am in a particular place where members of , say, a sexual minority congregate, but I might want my identity as 'member of that group' to be given out.

Visibility as a particular person

With one's identity, preferences, roles, and other information. With this full visibility all the tailored services for me are available, my device can be used for tickets or as a pass (see scenario) etc.

6.4 The backpack

Note how earlier in D6 the 'wash-bag' and 'carry-on bag' were discussed- they were shared assemblages of documentation, heterogeneous in type, which were all taken together in a bag as they were relevant to the place being visited. Further work on this project might see one's awareness device combining a mixture of forms of media, all concerning where one is going.

A backpack may reside only on ones awareness device, which might double as a PDA in this case. The main point is that the device must be capable of taking in heterogeneous forms of media- incorporating all the different forms of information and documentation that one might want to take. However, it may also be partly a virtual thing- and may actually interact with information services and hearsay.

It may be that one has a certain amount of information before one goes, then sends an information agent of some kind to collect more, and have it left in the city to be picked up when one arrives.

6.5 Physical hurdles and interconnections- a trail-finder

Note that in the raw fieldnotes there was a discussion of the sheer number of physical hurdles which greet the traveller. Able-bodied people might not normally notice stairs, long interchanges in an underground system if they are unencumbered, but these may come very much into sharp relief when one is carrying or wheeling a heavy case, etc. Suddenly stairs become very important. This is implicit in much of deliverable D4 where the affordances of a street or particular artefact (such as a set of stairs) can be very different for different groups.

The scenario document fails to even consider those with special needs. Their requirements in a trail may be quite different. Like the example of the London Underground briefly mentioned earlier, it may be that the best route for a traveller with a particular need may be a route that is counter-intuitive in terms of speed and direction, but which involves the minimum of interchanges, stairs and other physical obstacles.

How this trail comes about may be quite problematic in terms of the amount of intelligence we want the system to have, unless it is done by attenuating trails with user-groups- i.e., which way do users of this type go? Whether this can work with complex things such as the best way to get from Heathrow to Neasden if one is a disabled user, or has a heavy bag is another question. Perhaps the awareness device can poll local information resources in each station and work from there. The gist is that the device can work to find affordances for what particular group the user is part of (e.g. with a heavy bag, disabled, etc.) More work needs to be done on finding better design scenarios.

7 Appendices

Gloss scenario: Bob goes to Paris

Description produced by Starlab, UJF & TCD

February 19th 2001

Expectation of the day

Bob lives in Brussels. He drives to the train station to take the train to Paris for a business lunch with his colleague Jane. While Bob is in Paris, he hopes to see a bit of the city since he has never been there before. In the afternoon, Bob will take the train back to Brussels.

Leaving Brussels

Bob gets directions to a free parking space outside the train station. The parking space is activated by his arrival and connects to Bob's PDA to request his parking requirements and profile. The PDA specifies parking for 10 hours with travel to Paris (the PDA has this information because the PDA acts as Bob's train ticket.)

The profile allows the parking space to debit Bob's bank account for payment of the parking and to obtain other information. Bob's PDA refuses to provide some of the requested information in order to protect his personnel privacy: The parking space does not need to know that he is travelling first class.

Once Bob has parked, he is informed that the train is on time, and will leave from platform B, and that he should use the red entrance and that he should follow the red pathway to get to his platform. Because BOB is not listening to the radio, the PDA decides to communicate this information by vocal command using the car stereo speakers. Other possible communication channels include a personal headset (sown into his jacket) and a heads-up display on his car window. The heads up display tends to make Bob ill, so he has instructed the PDA not to use it.

The red route is not busy this morning. As Bob is walking close to an active wall, he is presented a message relevant to his trip in Paris (e.g., weather forecast, strikes in the public transportation along with alternate trip recommendations). On the way, his PDA vibrates to tell him that he has received a message from his mother's automated house manager. The message tells him that his mother has left the stove on, that she forgot to put the alarm on when she went out and that she forgot to take her PDA and her cell phone. The house has no way to contact her. For security reasons, the house informs Bob that it has been able to turn the oven off, but needs Bob's advice about the alarm system. Bob has privileged access to his mother's house and so he is able to turn the alarm on. Bob leaves a message for his mother saying that she should contact him when she comes back home. Further along the red route, Bob can see a large display actively communicating that the trains to London are cancelled due to the weather in the U.K. Bob is not directly concerned by this message but it does explain why there are so few people on the red route.

Arriving in Paris

Once in Paris, Bob tries to locate the public map that can tell him where he is. Being in Paris is a new experience for Bob. It is now only 10h00 and Bob has a couple of hours on his own before he meets Jane for lunch.

Bob thinks about what he would like to do with his morning. He is very interested in modern architecture and has always wanted to see the Pompidou Centre. There is a large green floor space close to the public map. It's an active area within which Bob's PDA can communicate with the public map and download the information that Bob is interested in. This includes very local maps, subway routes and schedules, travel recommendations, and travel delays. The PDA uses this information to estimate travel times to the station to the Pompidou center and from the Pompidou center to the lunch engagement.

Trails (anywhere in asynchronous time)

With art and architecture in mind, Bob logs on to the trail of his architect friend who lives in Paris. When Bob last spoke to him, he gave Bob access to his art and architecture profile in case that Bob ever has a chance to come to Paris. His friend has been building this trail over the years that he has been living in Paris. The trail now contains all the influences from the modernists. Bob is set for a busy day in Paris.

The trail starts with following the flat escalator that takes Bob to the correct exit. While travelling, Bob tries to contact his architect friend. Bob leaves a message for him.

Hearsay (Geographic location in asynchronous time)

Having the right direction Bob starts to move towards the Pompidou Centre. After Bob has walked a block he feels a vibration in his clothes. Bob's PDA tells him there is a café coming up around the corner that his friend in Denmark recommended last time he saw her. "L'Olympic, a café with the right Paris feel to it", were his exact words. Bob doesn't want to miss this, so he turns off the trail to the left at the next crossing. It's time for a coffee anyway and Bob sees that they have freshly baked croissants. When Bob sits down in the café, the active surface on the table informs him with of the local history of the café: Bob's profile knows that he is very much interested in being informed as much as possible about Paris. The piece of history Bob receives is that this was the hangout place for Le Corbusier when he was in Paris. There is a story about Maison Roche. This venue is something Bob adds to his agenda of the day. On the tabletop there are several trails being suggested to Bob by the local tourist office. Bob notes a trail that tells him a visual story about how a street crossing his trail looked before they built all the new buildings in that area. This is a part of a pooled service, accessible without wearable access, offered by the city.

Bob has coffee and is sitting, scribbling on the table. He accesses the picture bank of the café and sends a postcard to his Danish friend. He then receives a message from Jane. She is stuck in traffic and her PDA estimates that she is going to be an hour late for the meeting (the metro system is on strikes). Bob tells her that he has just done some sketches of some ideas for their city planning, she can have a look at them in the car before she comes to the meeting. Bob now has some extra time to look around. Excellent! His mother phones to say that everything is all right. She is having tea with her friend in the kitchen. Bob waves to Mrs Robertson over the videophone.

Radar (remote geographic location in synchronous time)

Out on the street again. With his radar tool, Bob is looking for a quiet place where he can prepare for the business meeting. Bob gets the information that there is a park nearby with several quiet areas. Bob gets directions to the park. When Bob get there he has time to go through the feedback Jane has sent. The space in front of Bob's bench is active and Bob can view his ideas on a larger scale. Bob appends some comments and sends it back to her.

After the park, Bob heads towards the Pompidou Centre. Bob doesn't want to be disturbed for an hour or two so he puts his receiver on a low mood that screens his calls so that only the really important ones come through.

Pompidou is a fantastic building with all the different pipes exposed on the outside. Outside is a large display with all the exhibitions in the centre. It gets activated when Bob enters a sculpture area within the interactive plaza, located outside the Centre. There is a Giacometti exhibition that Bob and Jane are interested in. He must make a decision on whether to see the exhibition or to continue on his friend's architectural trail (which, according to his PDA, is less crowded). His PDA reminds him that he does not have time for both. Bob chooses to stay on the trail so that he can visit the Institute Du Monde, the Arabic library and the Maison Roche.

After visiting these venues, Bob meets up with Jane. As he sits down, the menu appears on the tabletop. Jane recommends the fish. The table proposes a wine based on Bob's and Jane's profiles. As they are in hurry, they ask the table to order the meal. When they have eaten, they bring out the work that they had started earlier and continue to work on it. Bob and Jane use the objects on the table to illustrate their ideas for the layout of the site they are planning together. Bob names each object as he manipulates it. For example, the cup denotes a square, a spoon represents a street, lumps of sugar correspond to buildings. As he configures the physical objects, their virtual counterparts are configured in the shared electronic work-space displayed on the table.

Bob's PDA claims his attention. It is a message from his architect friend. He suggests meeting up for a drink at the Café de Paris before Bob takes the train back to Brussels. His plan was an earlier train but by changing his agenda, the PDA automatically reschedules the train. Bob accepts his invitation and adds the café to his agenda. His business lunch ends earlier than he had planned thanks to the exchange of ideas while Jane was stuck in traffic. Bob has time to catch the Giacometti exhibit before he meets up with his architect friend. After being in the exhibition for a half an hour, Bob gets a communal message telling that the exhibition is closing in ten minutes.

This is a bit earlier than Bob anticipated. Bob uses his radar tool to look for a crowded area to mingle amongst the Parisians. While Bob is walking, he changes his accessibility profile on his PDA to fully accessible. His PDA notifies him when it is time to start walking to Cafe de Paris. To avoid arriving late, the PDA stops providing new suggestions of things to see or do.

Back to Brussels

When Bob returns to Brussels, he notes that his parking authorisation has been automatically extended. His change in schedule also automatically reschedules the delivery of groceries. His family has been notified of his new arrival time. After dinner Bob displays a picture of Giacometti's sculptures on one of his interactive walls. The picture is one of the five that Bob downloaded at the Pompidou Centre.