Doors of Perception 7: Flow

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e-Gadgets case description

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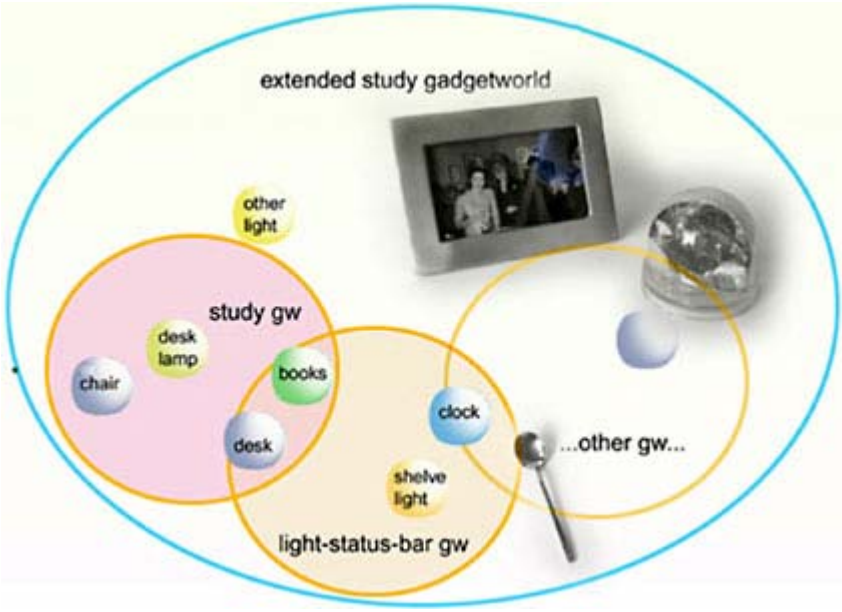
This in not a presentation about disappearing computer, but about the evolution of artefacts and the way people relate with them.

As Lars Erik Holmquist previously explained, the main idea behind the “ubiquitous computing”, or “ambient computing”, or “disappearing computer” concept is that the computer “disappears” and computing services are made available to users throughout their physical environment.
More and more applications are designed and realized, presented in conferences such as DIS, or DOORS, that evolve dispersed objects that work together for creating one experience.
So the question is: Are there ANY proposed technologies that support designers as well as people themselves, that enable them to create applications for Ubiquitous computing, without always have to start from scratch? And if there are, are they flexible enough, to possibly allow design with sustainability in mind? We will show you an example of a supporting software facilitating this.

Rationale:
What we initially had in mind when we set off on this project, was to make an infrastructure to enable designers, but also people themselves to make a wide range of applications with these new enhanced objects.
We thought; people buy objects and make their surroundings from them, arranging them and rearranging them as fits their needs. They buy furniture, and stuff, from shops, but then they make up their own home landscape with them as they want, and rearrange it when they are bored with it, until they are satisfied. We put around us things to be aesthetic, functional, emotional. As Tom Rodden has pointed out in the DIS 2002, last summer, people do that even in the construction of their houses. Houses, that maybe perceived as non-changing, solid architectures! Yet, over time, new plumming is installed, walls are demolished and new ones are build, kitchens are redone, ironwork change, lots of things may change. It is a fact of life that things we use and maintain over time, we adapt and we change. We should be able to do this with our forthcoming digitally enhanced environments too.
We, as designers should provide for the ‘right’ technologies to be developed by being in the right place, the right time: getting involved early, from the definition of research projects, and integrating our designer visions with visions coming from the scientists and technologists throughout the development of these technologies, from the very early stages, can be cruxial.



Innovation:
The overall innovation of the approach I am going to show you now is in viewing the process where people configure and use complex collections of interacting artefacts, as having much in common with the process where software system builders design software systems out of software components. In this approach we see the everyday environment as being populated with tens of artifacts, which people can associate in ad-hoc, dynamic ways. In this way new collective artefact behaviour can emerge as a result of interactions among artifacts.

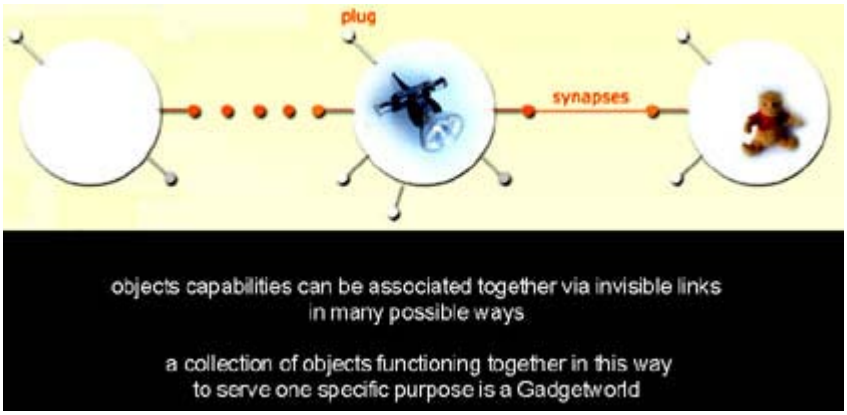
Basic concepts:
The basic definitions underlying this generic concept are:

eGadget: (www.extrovert-gadgets.net)
an eGadget is an autonomous and self contained artifact. It has both a tangible and a digital shelf (although these two may not necessarily reside together). A short of Black box. Generally speaking, extrovert Gadgets (eGts) are everyday tangible (physical) objects that have communication abilities, and a range of sensing, acting, processing abilities. Moreover, processing may entail "intelligent" behaviour, manifested at various levels

Plugs:
Objects have several capabilities, coming out of their software or their tangible shelf. They have a physical shape, weight, colour, they may give services (lights for example), they may be squeezable, shakeable, grabable, liftable, containing, as you can understand this can go on for ever as it is a long list of cababilities. Extrovert gadgets express their capabilities through plugs. So other gadgets as well as people using them, know what to do with them (connect them, plug them to each other).
Capability Plugs are software classes that make visible the eGt capabilities to people and to other eGts.

Synapses:
They are associations between two compatible Plugs. They are invisible links, explicitly created to achieve a particular working of the two capabilities together.

Gadgetworld:



The result of linking objects together via invisible links, is a Gadgetworld. A distinguishable, specific configuration of associated eGts formed purposefully by a designer, a user, or even an intelligent agent. A Gadgetworld consists of artifacts which communicate and collaborate in order to realize a collective function.

The generic framework that supports these add hoc connections, is called Gadgetware Architectural Style (GAS). This is a style that defines the concepts and mechanisms that allow people to create Gadgetworlds.

GAS-OS is a software that implements GAS. GAS-OS manages resources shared by eGts, and provides the underlying mechanisms that enable communication (and interaction) among eGts. Thus, it can be considered as a mini-operating system.
eGadgets can be considered to be to GAS OS what processes are to operating systems.

In principle, this approach can scale both “upwards” (towards the assembly of more complex objects, i.e. from objects to rooms, up to buildings, cities and so on) and “downwards” (towards the decomposition of eGts into smaller parts, i.e. towards the concept of ‘smart dust’). Moreover it treats evenly different objects, that may range from powerful ones (having their own processing and communication), to very minimal ones (that can be considered as tagged artifacts, which borrow processing and storage capabilities from servers for example). In this sense it is quite a democratic system for extrovert gadgets.

Right now, among other things we have a first version software tool to enable us to make synapses, we have currently made about 10 different e-Gadgets right now to test from. They range to include diverse things such as desks, lamps, carpets, clocks , MP3 players, among others.

Demo:
And now we are going to show you, with Achilles Kameas, a quick, simple demo example of the construction of a Gagetworld.

To set up gadgetworlds we use a sw tool at the moment, the Gadgetworld editor. I open it now.
The editor is in fact an e-Gadget itself. A powerful one.
It 'finds' the other e-Gadgets that are around (in the network vicinity). Lets see what we have here: A MATHMOS lamp (called tumbler flip) that is converted into an extrovert gadget with an added wireless into it. (this ones processing power is external and resides into an ipaq right now).
And an MP3 player: at this moment we borrowed the WinAmp of a laptop.
I can put all the objects I want, two or more, in my cooking pot, and make a set of associations between them.
The two objects here are both converted into e-Gadgets. That means in simple terms that they have a software shelf that enables their cababilities to be Plugs and therefore able to be connect together. If I want to associate them together in a gadgetworld, I have to associate their capability plugs. Lets do this.

I see here what are the plugs of the two eGadgets. The plugs of the devices is something that is created by their manufacturer, it potentially may be able to be updated via the editor (i.e. by individuals that have programming knowledge for example, who may be making new plugs for devices and making them available via a global network). So the Mathmos light has at the moment one plug: a side plug: it knows which side its on. Other eGadgets could also have several more plugs, related to their physical properties (shape, colour, use –i.e. shake, squeeze etc-, location). This one has one at the moment the mp3 player has some other plugs associated with it, ie: a pause, play, track, and gender kind of music.

Lets make a link between the music category- gender and the side of the matmos brick-like light.

The plug editor is a draft first version prototype at this moment. The editing can be done by several devices (i.e. a PDA, or other devices).

Now lets see the Gadgetworld we did in action. I turn the Mathmos, and the music type should change.

Potentially anyone of you can associate objects in many different ways, to make applications using extrovert Gadgets. Example applications may range from children's games, application for people with mobility difficulties, elderly, home comfort, etc. Moreover GAS can be an underlying technological infrastructure, for researchers that want to do home-automation, experiment with agent based intelligence, etc).

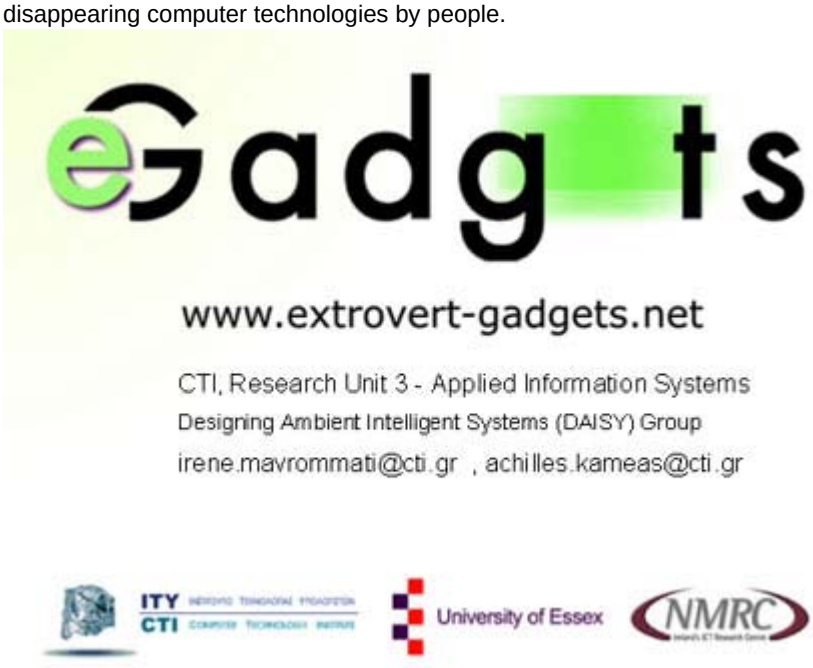
Extrovert gadgets is a IST FET (A European Future Emerging Technologies) research project funded by the Disappearing Computer initiative. Partners are CTI (doing the sw architectures), University of Essex (doing the intelligent agents), and NMRC (creating sensor networks and the packaging and miniaturization of the tangible part of the objects). It is a 3 year project, now in the middle of its duration.

But Why should we get exited about what the e-gadgets technology offers?
Because:
1st. It is a scalable approach. Covering in its conceptual framework a wide range of all shorts of objects (from a tag to a desk to a house, from sercvice carriers (heater, TV, light, stereo) to tangible (furniture, keys, clothes, carpets, boxes).

2nd. It gives a vision on how -even the more mundane of- tangible objects may evolve in the future, and what role people may have in this landscape (make the Ambient applications they want, or alteration of the ones they are given).

3rd. It can serve as a common referent between designers, people and artifacts, and it gives a bridging technological (middleware) solution.

Epilogue
What we set out to do is to consider people as active shapers of their environment, not as simple consumers of technology.
And as designers, perhaps we should keep in mind the role sustainability and openness to change has in the use of our objects and spaces. It is important I believe to make technologies that allow for flexible, even unpredicted uses of disappearing computer technologies by people.



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