

Interface-Me: Pursuing Sociability Through Personal Devices

Ion Conostas and Despina Papadopoulos

5050 Ltd.
86 Forsyth Street
New York, NY 10002 USA
tel. +1 917 237 0069
fax. +1 917 237 0070

Abstract

In this paper we describe the fundamental principles that guide our work process at 5050Ltd, in developing concepts and prototypes for personal technology devices.

We maintain that in designing personal devices it is critical to address the social interaction elements of the user experience. We introduce the term "social functionality" to refer to those aspects of a device that are specifically designed to elicit sociability and serendipity. It also refers to those aspects which enable users to communicate or represent individuating characteristics through the use of their device. Social functionality is seen as a critical success factor in the design of future personal devices.

Introducing social functionality in personal technology devices requires a multidisciplinary approach. Design and technology are seen as inseparable elements of the development process.

The mbracelet¹, a wearable prototype we developed for, and in association with, NCR's the Knowledge Lab, is used as a case in point.

Keywords

design, social functionality, human-to-human interaction, mbracelet, wearability

1. Personal technology devices today-tomorrow

It is an undisputed fact that technological development has been the driving force in shaping the socio-economic landscape within which we live, work and interact. It is also safe to assume that the acceleration of technological adoptability is dynamically transforming our environment and relationships as we speak. In this frantic pace of change, product innovation is often technology-driven.

This has been particularly the case in the field of personal technologies.

Today, emerging technologies offer an unprecedented array of possibilities. Chip miniaturization and broadband connectivity translate into powerful computers becoming portable, wearable and embedded in all sorts of personal objects. Data transmission capabilities and the establishment of a networked economy mean that the activities of work and life itself can, to a large extent, be carried out through personal devices.

From web-ready cell phones and new generation wireless PDAs to a whole array of other, never before thought of, internet capable devices, it is evident that personal technology is moving away from the desktop space and into the personal space.

At the same time, a race for smaller, faster, more-functions devices is on.

¹ mbracelet © NCR, The Knowledge Lab

As the market for personal devices, however, shows increasing signs of uniformity it is becoming clear that technological innovation alone is insufficient in order to compete effectively. At the same time, the proliferation of the digital world has led to a growing trend to correlate virtual spaces, web sites and brands with personal electronic devices. This trend has been partly driven by a desire to re-establish physical connections and introduce physical tokens and representations into the world, and partly by the market's desire to introduce novel branding techniques. The result has been a growing reliance on personalization and customization of products and services as a powerful way to achieve product differentiation.

In their effort to compete effectively, therefore, personal device manufacturers often focus on how to be better in "creating needs" while designers concentrate on "designing" experiences and lifestyles.

We take a fundamentally different approach in designing personal technology devices.

2. Innovation by design

It is our view that personal devices of today have a particular, distinct nature, one that catapults them into the core of human activity. Their proliferation and the multitude of mobile contexts of use have meant that users progressively partake in the social through or with such devices. Being worn, carried about and ever-present, personal devices are inexorably tied to identity and social spaces; the private is fused with the public, domestic spaces meld with professional while connections and relationships are inevitably qualified through them.

As design practitioners we are therefore faced with the challenge to develop not only streamlined devices, but devices that will prescribe *how* we are to interact with the world and others; *how* to express and communicate our identity and *how* to define our space. Innovation by design is no longer a

question of form, shape, colour, line and material alone. As personal devices define our spaces and lifestyle it is no longer enough to simply attend to colour and style or depend on them to infuse a device with emotional elements.

More importantly, we maintain that innovation requires a realization of the degree to which technology becomes entrenched in people's daily experiences and as such a realization of the role that personal devices can play in the process of social interaction.

In designing personal technology devices, it is our view that effective differentiation cannot be achieved by creating needs. Rather, it is achieved by addressing needs that have been neglected or considered irrelevant, namely social interaction needs.

In addition, personalization and identity cannot be prescribed. The role of designers is not to 'design' experiences and lifestyles. Instead, it is to design favourable *conditions* for certain experiences to occur and accommodate or promote certain lifestyles.

In the present environment of augmented possibilities, to innovate, designers need to extend their traditional scope; to become informed about the prevalent social interaction needs and to design personal devices that aim to accommodate them.

3. Social Functionality

The realization that technology is becoming increasingly central to human expression is critical in qualifying the design of personal devices. It is therefore important, along with issues of form, functionality and human-computer interaction to equally address considerations of *human-to-human interaction*. In creating a personal device which will also work as an effective vehicle for human-to-human interaction we extend the device's functionality to engage social components, or else, what we call *social functionality*.

Social functionality is here described as an addition to the device's core functionality, one which enables the device to be used as an agent of sociability and serendipity. Sociability is defined as "the inclination to seek or enjoy companionship", serendipity as "the faculty or phenomenon of finding valuable or agreeable things not sought for."

Social functionality is, in this context, used in antithesis to gratuitous non-functional characteristics with which devices are often embellished in order to generate emotional appeal. Such non-functional characteristics are designed to engineer a relationship between the user and the device; to instigate a psychological attachment to the device; such a relationship is typically human-to-machine. It may be placed in a social context only indirectly, in as far as this relationship itself has a social bearing.

Social functionality, in contrast, refers to those technical characteristics of a device which enable it to be used as a tool in promoting human-to-human interaction. As such, it is designed to empower the user to generate instances of sociability through the use of the device. In doing so, the user sets up the conditions for instances of serendipity to take place.

Instilling social functionality to a personal device requires a multilayered / multidisciplinary approach to the design process. It is contingent upon the successful combination of different types of expertise and of different perspectives. It requires the close collaboration of designers, engineers, social scientists and the involvement of the users themselves.

To be effective, however, social functionality needs to be designed into a personal device, to be blended into the overall 'look and feel' to ensure seamless and intuitive usage patterns. Innovative designers can therefore play a leading role in the development process by exercising their ability to bring people together and their ability to synthesize. Instilling social functionality requires a clear understanding of the social interaction needs of the user group; and a clear understanding of the

possibilities offered by both technology and design to best address them.

4. The mbracelet

The **mbracelet**, a wearable computer prototype we developed for NCR's the Knowledge Lab, can serve as an example of our design approach.

The mbracelet was developed as part of a research project, investigating the introduction of wearable computing applications in financial transactions and in particular for use with ATM machines. The project targeted teenage users and aimed at exploring novel ways to bring financial transactions closer to teenager's daily experiences.

Instilling social functionality was central to our design and development approach. It was therefore essential to study the complexities of social interaction patterns within the targeted group.

It was found that social interaction centered around the following activities: Collection and sharing of information, mainly through electronic means (internet, telephone, e-mail, pager messages)

Forming a number of closer associations within the group

Exchanging and sharing physical objects either as part of a game or as means to establish a closer personal link.

Communicating to other members of the group personal tastes, preferences and affiliations.

We decided to develop a bracelet that is able to store, share and collect information. At the same time it can be worn as a fashion accessory. The challenge was to develop a tool with which a series of financial transactions could be carried out but which at the same time would be considered by the users as an integral part of their daily social activities.



Picture 1: mbracelet, front view (mbrace01.TIFF)

The current prototype connects to a home computer for viewing or storing information and for accessing the internet, connects to a prototype ATM machine instead of an ATM card, connects to point of sale stations and functions as a “key” to different access points (the house, work-school environment, gym pass).

The mbracelet is designed around an **open architecture** system. We used the iButtons as the mbracelet’s main platform and storage device. Developed by Dallas Semiconductors, the iButtons are 16mm computer chips armoured in a stainless steel case. They can talk to desktop, laptop, and hand-held PCs, as well as to a variety of hand-held reader/writer devices, including cordless models that collect data for later downloading to a PC.

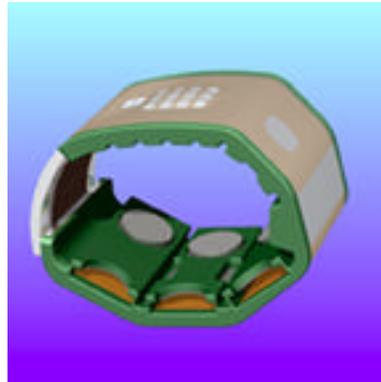


Picture 2: ibutton (ibutton.TIFF)

A 2-wire interface, fitted at the inside-the-wrist part of the mbracelet, is sufficient for the iButtons to make contact with a host unit, thus allowing for an easily implemented infrastructure.

The mbracelet is designed to incorporate 3 slots that can receive interchangeable iButtons. This enables users to customize the information they want to “carry” with them at any given time. The mbracelet’s **Modular** design is central to its functionality and is aimed at facilitating the bracelet’s inclusion into everyday activities.

By developing the mbracelet as a platform for the iButtons, users can decide which modules (iButtons) will be relevant for their different activities. They can put together the information that is pertinent to a particular day without having to carry everything with them at all times. An iButton containing medical records, for example, could be the only part of the mbracelet’s configuration when visiting a doctor.



Picture 3: mbracelet, 3D model with iButton slots (3DModel.TIFF)

At the same time, users can exchange modules with each other and in this way share information or applications they have developed with this purpose in mind. This part of the mbracelet’s functionality is designed to introduce elements of **physicality** into social interaction.

As a large number of activities and transactions are conducted in virtual environments it is important to re-instate physical dimensionality as well as physical practices. Among teenagers this manifested itself through the practice of exchanging cards, games or other intimate physical objects.

In addition, in our effort to introduce, when appropriate, instances of physical

contact between users, we designed the mbracelet's "plug" interface in such a way as to allow users to transfer messages electronically to each other by performing a cross handshake. When the two "plugs" mate the mbracelets poll each other and messages are transferred automatically. The gesture is intimate and dynamic; it fuses the realm of the digital with that of the physical. When two mbracelets meet in a cross-handshake they act as agents of sociability and serendipity.



Picture 4: mbracelet, back view, plug interface (mbBack.TIFF)

To facilitate the mbracelet's inclusion into teenager's everyday environment, issues of **aesthetic** considerations and of seamless usage patterns were particularly addressed.

Wearability of the device was critical. The mbracelet's mechanism was built onto a flexible circuit in order to make the mbracelet completely pliable. The circuit was then moulded into place in polyurethane rubber in eight bright colours. The choice of material ensures that the mbracelet withstands wear and tear, is waterproof and is aesthetically pleasing to teenagers. It is our view that no matter how important information is, people need first and foremost to be perceived and feel like humans, preferably stylish ones.

The mbracelet's interface is transparent. It automatically knows where to find and retrieve (or write) the appropriate information when the user connects to any host unit, ensuring ease of use.

The mbracelet is also fitted on the two ends with conductive hook-and-loop. When the two ends are clasped the circuit is complete and the mbracelet's mechanism is switched on. Using the conductive hook-and-loop as a clasping mechanism allowed us to do away with an additional switching mechanism. In this way, the mbracelet can be seen as a truly wearable item, maintaining the characteristics of non-digital accessories and clothes.

5. Individuating characteristics (personalization)

To accommodate teenager's practice of expressing their individuality in a visual manner, the mbracelet was designed to incorporate a grid of 12 tri-colour LED's. This LED display has a dual function:

When the mbracelet is connected to a host unit the grid displays a host-specific RGB animation so the user knows that contact has been successfully made. The LED display, however, can also be used as a tool for introducing elements of personalization to the device. The user can program customized RGB animations at will, to communicate desired individuating characteristics.

The LED display also fulfills an aesthetic purpose: users can activate a color display that changes depending on hand motion. In this way the mbracelet can also be worn while dancing, for example, allowing the user to create a personal choreography.



Picture 5: mbracelet, LED display (lights.TIFF)

The mbracelet's tri-color LED display serves as a context-specific example of how social functionality can empower a user to define and communicate his/her identity or individuating characteristics through the device. Technology is used in this context to allow the user to dynamically modify or manipulate elements of the device to that end. Such empowerment is therefore open-ended. The device is used as a tool to allow the user to creatively express his/her personality and engage in relationships with other people. The device is not itself part of such relationships; it acts as a vehicle for human-to-human interaction.

6. Mbracelet – the future

The first phase of prototyping involved 10 mbracelet working prototypes and helped identify those technical and production aspects that needed refinement. At the time of publication, a second batch of 100 improved mbracelet prototypes is being manufactured. It is our understanding that these will be used by The Knowledge Lab to conduct comprehensive user testing in order to determine to what extent the mbracelet meets its goals and what modifications, if any, should be incorporated in a possible future commercial version of the device.

It is important to note that the mbracelet project was a research project in character. Its primary aim was to investigate and explore alternative ways to incorporate technology into everyday financial transactions. At the same time it set the stage for a discussion on far wider issues related to human interaction in the age of technological prevalence. Our approach to the design of this wearable personal device has centered on our concern to combine device functionality with social functionality, in line with existing social interaction patterns within the targeted group. As such, the mbracelet is meant to operate as an example of the way technology can promote, and be part of human interaction.

Conclusion

The mbracelet prototype is an illustration of our approach to the design and development of personal computing devices. In our model, design takes a central role in the development process, all the way from concept to prototyping. In our model, engineering too has a central part in the whole process. Our notion of social functionality requires the close collaboration of designers and engineers in all stages of development, if the possibilities offered by emerging technologies are to be identified and appropriately synthesized. Social functionality needs to be designed into the mechanism of the device if it is to effectively perform its task of empowering users to generate instances of sociability through the use of their devices. Open architecture, modularity, adaptability, the incorporation of innovative materials to ensure seamless usage patterns and allow for wearability, are all essential infrastructure elements on which social functionality can be built.

In our model, the role of the people who are to use the device is also central in the development process. An understanding of how new technologies and new devices alter interaction between people and their environment is crucial. It is our view that personal devices must be designed in a way to progressively accommodate users and their routines.

Instilling social functionality to a personal device is a powerful way to create innovation by design. Technology is a versatile tool for opening up possibilities. But it is always human interaction that creates meaning. Instilling social functionality is also a powerful way to create product differentiation and customer loyalty. Enabling users to actively express their identity and creativity through the use of their device is a particularly potent way to generate emotional appeal.

References:

1. Bensky, Xavier and Usman Haque. "Tamagochi: And they Call it Puppy Love." Neo-Tokyo on-line magazine, " March 1997.
2. Buxton, William. The Three Mirrors of Interaction: a holistic approach to user interfaces. Proceedings of Friend21 '91 International Symposium on Next Generation Human Interface, Tokyo, Japan, Nov. 25-27, 1991.
3. Giller, Verena, Manfred Tseligi, Reinhard Sefelin, Anu Makela, Aapo Puskala, and Kristiina Karvonen. "Image Makers." Interactions, Special Issue, Maypole Highlights, pp.12-15, November + December 1999.
4. Norman, Donald A., *Things That Make Us Smart: defending human attributes in the age of the machine*. New York: Addison-Wesley Publishing Company, 1993.
5. Oosterholt, Ron, Mieko Kusano and Govert de Vries. Interaction Design and Human Factors Support in the Development of a Personal Communicator for Children. ACM CHI '96 Conference proceedings on Human Factors in Computing Systems, pp. 450-457, Vancouver, Canada, April 13 - 18, 1996.
6. Robert Lambourne, Khodi Feiz and Bertrand Rigot: Social Trends and Product Opportunities: Philips' Vision of the Future project. ACM CHI '97 Conference proceedings on Human Factors in Computing Systems, pp. 494 – 501, Atlanta, Ga., March 22 - 27, 1997.
7. Thackara, John. "The Edge Effect." Lecture delivered at Scope 1: Information vs Meaning, Vienna, Austria, September 30 - October 1, 1999.
8. Thackara, John. *Winners! How Europe's Most Successful Companies Use Design To Innovate*. Amsterdam: BIS, 1997, London, Gower, 1999

5050 Ltd is a design and development company specializing in wearable computing applications for personal technologies. 5050 Ltd is based in New York City, USA.

www.5050ltd.com, www.interface-me.com