To what extent is the relationship between innovation in academia and industry preventing Anthony Dunne's 'post-optimal object' from entering the mainstream of consumer culture?

By
Daniel
Braithwaite

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London College of Communication

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Abstract

This paper sets out to understand the extent to which Anthony Dunne's post-optimal object has entered mainstream consumer culture and how the combined innovations towards post-optimisation in academia and industry have helped or hindered this. I introduce the concept of the post-optimal object and highlight five key features that post-optimal objects possess. I focus on tangible user interfaces (tui's) for non-verbal communication as an example of a post-optimal object, and to resolve the question I compare three case studies of such interfaces, developed in both academia and industry. For each case study I investigate the cause and effect of the innovation to understand how each development has affected mainstream consumer products, and how a different approach in academia and industry has influenced this. I then use my findings to explore this relationship, and to identify if and in what circumstances, a post-optimal object can exist in mainstream consumer culture.

Part 1: Introduction

In this section I introduce Anthony Dunne's alternative philosophy and the concept of a post-optimal object. I then explain the evolution of tangible user interfaces (tui's) as an example of a post-optimal object and the increasing importance of developing communication devices that allow us to communicate emotionally over long distances. Following this I describe the developments that have already occurred in this area and the reason behind this particular research. I then identify the key areas of investigation and establish the research methodology.

1.1 Anthony Dunne's "Post-optimal object"

In his 1999 publication, Hertzian Tales, Anthony Dunne argues for an alternative future in the development of electronic products that is focused more on metaphysics, poetry and aesthetics than on performance or technical functionality. His argument stems from the lack of cultural speculation in the design and development of electronic products, leading interaction designer Gillian Crampton Smith (1999) states in the introduction to the book, 'the development of electronic products is currently led by the engineers and marketers of technology companies and what they think will sell'.

Dunne compares innovation in electronic products to the world of architecture or furniture design, which he believes have successfully operated in the realm of cultural speculation for some time. Architecture has long been influenced by the effect that buildings have on the lives of the people who live and work in them. Also the culture of the "ideas competition" has given a constant supply of conceptual designs not intended to lead to actual buildings 'but to disseminate radical ideas about how architecture, and the life that it accommodates, might be differently conceived' (Dunne, 1999).

Electronic products also play a huge part in shaping our social and cultural experiences but the creators of consumer electronics have not used design to explore how these products may be able to enrich our lives further. Instead they have been focused on creating added functionality, converging technologies or simply making the device smaller, so they perhaps develop a device that is not just a phone, but also an MP3 player and a camera, and it is still no bigger than a box of playing cards.

Dunne suggests though that in much of the world of consumer electronics we have reached the optimal level of performance. That is not to say that the performance of the electronic products we have today cannot be bettered, but more the ability to enrich our lives further by adding more functionality has been reached. For example is having 30,000 songs in our pocket, much more life changing than having 20,000? How can an alarm clock wake us up any better than one that is currently available?

What is more, this focus on performance optimisation has often reduced the enriching aspect that these products can give our lives. For example the modern pocket digital camera is a great piece of technology, amazingly convenient, good quality and relatively cheap. However unlike a traditional camera, there is no option for misuse, the autofocus features and steadyshot stabilisers mean that if you felt like getting creative and interpreting your own vision of a perfect photograph, it will not let you. It's a widely held belief that digital cameras are soulless objects; with their added "functionality" they have lost what many people loved about them in the first place.

This aspect of electronic products is summed up nicely in a quote by Dormer in The Meanings of Modern Design (1990), that despite its age, still holds very true:

> This is what differentiates the 1980's from 1890, 1909, and even 1949 – the ability of industrial design and manufacturers to deliver goods that cannot be bettered, however much money you possess. The rich find their exclusivity continuously under threat…
> Beyond a certain, relatively low price (low compared with other times in history) the rich cannot buy a better camera, home computer, tea kettle, television or video recorder than you or I. What they can do, and what sophisticated retailers do, is add unnecessary "stuff" to the object. You can have your camera gold plated.

In response, Dunne claims the challenge to modern designers is the "post-optimal object," where the challenge lies in metaphysics, poetry and aesthetics, to design products that acknowledge the effect they have on the lives of the users and how they themselves mediate social interaction.

Much of Dunne's work is very conceptual and intentionally subversive but I believe there are certain features that can be applied to a consumer product to make it post-optimal:

- Feature 1: Interaction is based on natural gestures, which creates a more intuitive experience. 'Machine Intelligence will serve to make the environment more efficient and more intelligent so that it will be able to respond more dynamically and interactively to human beings' (Weibel 1994).

- Feature 2: Technology embedded in familiar objects, which provides a "transparent" interface.

- Feature 3: The object in its entirety should be considered an interface; 'Although most (traditional) work in this area tends to reduce the object to a "graphical user interface," [through] a screen, designers are beginning to explore the full potential of the "thingness" of the object… this could lead to more sensual interfaces than screen and offers new aesthetic qualities' (Dunne, 1999 pp.16-17).

- Feature 4: The object is as much about its playfulness or quirkiness as its functionality or performance.

- Feature 5: Despite the fact they incorporate technology, in post-optimal objects the technology is never the focus or "raison d'être" of the product, they could be said to be "anti-technology".

The term post-optimal can be used to describe a variety of products; both tangible objects such as electronic devices, home-ware, furniture etc. to intangible media such as websites and films. However for the purpose of this research I am going to focus on Dunne's original frame of reference, the physical electronic device and in particular the development of tangible user interfaces that are focused on mediating non-verbal communication, which from here on in I will refer to as "tangible emotional communicators".

There has been a lot of research in this area over the past ten to twelve years, exploring ways in which technology can let loved ones communicate emotionally over long distances. The nature of these devices, their focus on play, natural

gestures, personalisation and an overall view on “enriching” and “developing” digital communication beyond it’s accepted role in society makes them true post-optimal objects.

1.2 Tangible User Interfaces

The development of tangible user interfaces (tui’s) is an evolution born out of the concept of ubiquitous computing, a vision of the future first realised by Mark Weiser, a former head scientist at XeroxPARC. He outlined in his seminal 1991 paper, The computer of the 21st century, how the current (of the time) trends in computer development were flawed because they were not focusing on true multimedia, they were too focused on an abstract medium that demands attention; the screen. His philosophy was that if a technology is to be truly profound, then it must disappear from sight and mind. In Weiser’s own words, “Machines that fit the human environment, instead of forcing humans to enter theirs, will make using a computer as refreshing as taking a walk in the woods”.

Since then many contemporary scientists, engineers and designers have shared this view, notably Durrell Bishop and Hiroshi Ishii founder of the Massachusetts Institute of Technology’s (MIT) Tangible Media Group. Bishop’s work concentrates on creating products that strongly resemble their intended use of function, as Bill Moggridge, co-founder of internationally acclaimed design firm IDEO explains in his book, Designing Interactions (2007 pp. 541), ‘he [Bishop] looks at electronics and notices that the shape of the object does little to describe what they are actually doing; it is hard to see the difference between a calculator and a radio by their design’. This philosophy is highlighted in one of Bishops earliest and most well known works, the marble Answering Machine (figure 1) from 1992, where small marbles were used as tangible representations of a message. Although a simple device it highlights some important considerations important to tui’s and also to post-optimal objects; a simple interface, utilising materials known by all (marbles), playful and almost surreal in the way it gives tangibility and visibility to something, i.e. the message, that we have only known to exist inside an unknown device.

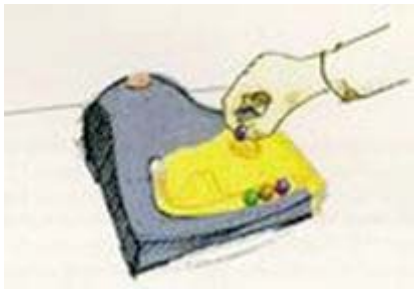

Figure 1

The work done at the Tangible Media Group at MIT has a similar “representative” focus, but more than this it shares Weiser’s view that technology should work around humans and seamlessly integrate into our lives, not the other way around. In terms of communication it is about developing technology that allows us to interact in our own unique ways without adding layers of complication through impractical, cumbersome devices or uniformity through the screen. The beauty of a tui lies in the art of interpretation and subtlety and the way that it can be designed to be less invasive into people’s lives. Hence the development of communication devices to allow people to communicate with greater focus on emotion as opposed to information transfer.

1.3 Non-Verbal Communication

Our “traditional” means of communicating digitally (tele / VoIP phones, email, instant messenger, etc.) have been focused solely on making us more mobile and allowing us to access and store information more efficiently. They have not given us the ability to utilise non-verbal forms of communication such as gestures and body language in our communication. This is a shame as the non-verbal aspects of our communication are some of our most important tools for displaying emotion.

For instance phatic communication, a term first coined by the anthropologist Bronislaw Malinowski who defined it as communication “whose only function is to perform a social task, as opposed to convey information” (Ogden & Richards, 1923). Much of our communication is in fact phatic, although we probably don’t distinguish it as such. When we ask someone “how’s it going?” we are most likely using a generic greeting, not actually investigating how “it” really is going. Similarly when we feel uncomfortable in someone’s company, perhaps in a confined place such as a lift or in

a taxi, we may start up a conversation about the weather, however we are most likely doing this for social reasons as opposed to a shared interest in meteorology.

Phatic exchanges exist to confirm that communication channels are open and they can be used to maintain physical, psychological or social contact. Traditionally these exchanges and gestures are made face to face and in person as people traditionally lived in a close knit structure surrounded by friends and family, however in the modern global society where many couples and families are separated by work or other commitments it is increasingly important that people can communicate in this intimate and personal way over long distances. The development of tangible devices for non-verbal or emotional communication, often termed “phatic technology”, is the result of a convergence of two trends; the technological advancement of ubiquitous computing and the social dispersion of people around the world through globalisation.

There have subsequently been some groundbreaking developments in the field of tangible emotional communicators or phatic technology, stretching back to 1997 with the development of inTouch by Scott Brave, Andrew Dahley and Hiroshi Ishii at MIT. inTouch was the first device to explore new forms of interpersonal feedback through touch. It is based on the concept of touch being an important part of inter-personal communication, be it a handshake, a hug or a pat on the back, that is however as yet unexplored in the realm of inter-personal communication technology. The two connected objects each consist of three cylindrical rollers mounted on a base (Figure 2). When one of the rollers is rotated, the corresponding roller on the remote object rotates in the same way, which gives the users an impression of a shared experience (Brave & Dahley, 1997).

Figure 2

Chang, Resner, Koerner et al. continued this idea with the development of LumiTouch (2001) which was based around two interactive picture frames that light

up when the corresponding one is touched. This project introduced some fundamental aspects of tui's and in turn of post-optimal objects. The technology was embedded in familiar and treasured objects that have sentimentality to the people using them. It also introduces the concept of language and relies on people using a passive communication tool such as light or colour to develop their own language, an important element of tangible emotional communicators.

Figure 3

Innovation in emotional communication devices has not been limited to MIT either, in fact important developments have occurred at institutions around the world. Notably, Gustbowl developed in 2003 at Delft University in the Netherlands where the focus is on mediating the bond between a parent and a grown-up child. The device is a non-invasive communication device that builds upon the concept of coming home (Van Der Houg, Keller, Stappers, 2003) and the ritual associated with it. Hug over a distance, developed at the University of Melbourne was another phatic device that involved a haptic vest that gave the user a "hug" when their partner hugged a toy koala.

In addition to this development in academia, similar conceptual devices have also been developed by commercial organizations such as Philips and IDEO. However despite this sizeable amount of conceptual development in tangible emotional communicators there has not been an obvious diffusion into commercial development. The intention of this research is to understand why this is and specifically if different methodologies of innovation in academia and industry are the cause for tangible emotional communicators not being developed for the mainstream consumer.

To resolve this question I have identified three very different projects, developed in both academia and industry that I will investigate. From academia I have chosen Connectibles!, a tangible social network developed in 2007 by Jeevan James Kalanithi at MIT. From industry I have chosen to look at one of the projects Philips created as part of the 1995 Visions of the Future project entitled Emotion Communicators. Finally the third project that I will look at, Social Mobiles was a collaboration between the design firm IDEO and the artist Crispin Jones, and was a project designed to start a discussion on the social effect of mobile phones.

However before explaining these case studies in further detail, I believe it is important to clarify what I am interpreting as innovation as there are a number of alternative definitions from which to choose.

1.4 Innovation… a definition.

There are many varying definitions on what constitutes innovation. On one extreme are those that say innovation is dependent not only on a radical change of thinking or even the development of a revolutionary product or service but on real market success. This means that the “innovation” must create added value. The UK department of trade industry for instance only records “successful” innovations in this way. I think however that this focus on profit is slightly backward looking, from a “web or tech perspective” in that it completely ignores the concept of open source, which is widely regarded as the biggest innovation enabler in the world today.

On the other extreme sits one of the earliest and most respected advocates of entrepreneurship and innovation, Peter Drucker, who defines innovation as “change that creates a new measure of performance” (1993). Others though have a slightly more liberal definition; McKeown (2008 pp.1) defines innovation as “new stuff that is useful”. Perhaps too simplistic a definition, but he does accompany this with two important questions “useful to whom?” and “how new is new?” Useful to whom suggests that usefulness is in the eye of the user therefore you must share your idea and actually benefit someone or something to be considered to be innovative. How new is new indicates that an idea does not have to be completely new, it could be an old idea applied to something new to create innovation.

All of these definitions are of course true dependent on what aspect of innovation and what industry you are looking at. However for this research, comparing innovation in industry and academia, I think a definition that requires physical development but does not take into account financial success is best. As I am focusing on tangible user interfaces I think it's useful and pragmatic to distinguish the limited "actual product development" of interfaces and devices, from the huge amount of research on the subject. Similarly it would not be prudent to measure success of innovation in purely financial means when work done in academia is being taken into account.

1.5 Research methodology

The research I undertook was a combination of primary research such as verbal interviews and email questionnaires and secondary research through academic texts and research papers.

Anthony Dunne's post-optimal object is an alternative approach for designers developing electronic products that is focused more on metaphysics, poetry and aesthetics than on performance or technical functionality. The main focus for this research is tangible emotional communicators, which are increasingly important due to the increasing dispersed nature of society. The key developments that have already occurred in this area suggest the technology exists to create consumer products that allow us to communicate in this way, yet this has not happened.

Section 2: The Case Studies

In this section I introduce the three case studies that I will use to compare innovations within academia and industry. I introduce each project by explaining the motivations behind developing the product and giving a brief description of how the device works. I will then briefly explain the post-optimal aspects of the product and what has been the resulting effect of the innovation.

2.1 Connectibles! (academia)

Product background & description

Connectibles! is a tangible social network based on gift giving, developed by Jeevan James Kalanithi a masters student at the MIT Media Lab in 2007. Connectibles! is based on the idea that users give customizable gift objects (the connectibles in question) to their friends. These "connectibles" can incorporate a range of interaction modalities such as visual, tactile and aural. These connectibles then get put into "friend frames" (figure 4), which give a physical representation of the users' social network.

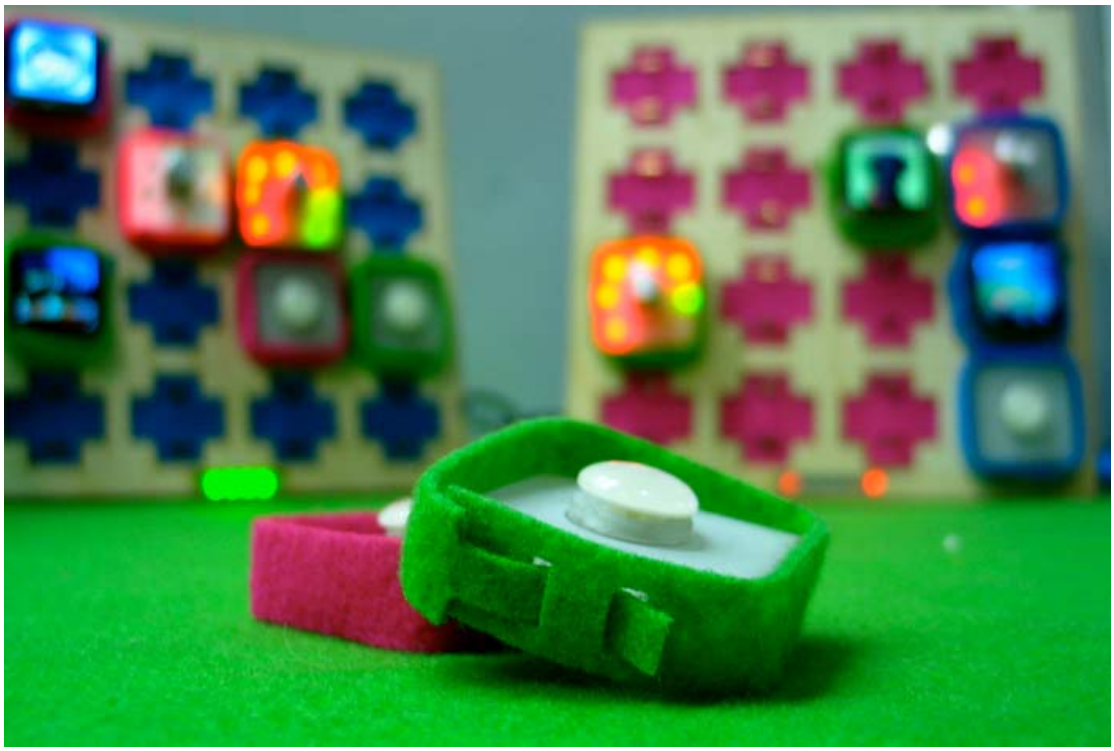

Figure 4

Kalanithi based this idea on a combination of signaling and object theory. Signaling theory is an important tool in which to examine human communication, the origins of which lie in the Darwinian view that organisms / we exist in a competitive environment that pressures them / us into expending less energy in their pursuit of survival than their / our competitors do. We exist in a world of social signals and we must determine the reliable signals from the unreliable. In his accompanying thesis Kalanithi describes the classic comparison between a poisonous snake, the coral snake that uses its bright red and yellow colouring to warn off potential predators by expressing its dangerousness. At the same time there is the un-venomous milk snake that has the same colour scheme to fool potential predators into thinking it is dangerous. One is sending a reliable signal, the other is sending an unreliable signal.

Kalanithi is primarily concerned with the reliable signaling of social relationships, and this is based on the concept of cost – as in honest and reliable signals are more likely to be costly. How do we determine who really is our friend for example? Joe might say he is your friend, but why should you believe him? This basic signal of speech carries a low cost, however if Joe was willing to pick you up from the airport, in the middle of the night, then you would be more likely to believe his is a genuine signal, as that is a high-cost signal from Joe.

Kalanithi then links this with object theory in which he differentiates commodities and memento's in terms of their use value, exchange value and symbolic value in that a commodity such as a can of coke, has a clear use value and exchange value but little symbolic value. A memento on the other hand has a great deal of symbolic value and thus little exchangeability. A memento can then be defined as a "physical object that has a unique meaning to some person or group of people that no object could be easily substituted for it" (Kalanithi, 2007).

Social memento's are where the symbolic value of an object lies in the relationship it signifies; a wedding ring being a good example. As gifts, social mementos have been used throughout history to represent, construct and maintain social relationships. And this is where the cost aspect of signaling theory is important as the value of a gift determines the symbolic value. This is not necessarily concerned with monetary value either; a particularly well-chosen gift shows a high value of emotional commitment invested in that person to know what gift they truly want.

Condensing Kalanithi's thesis into just a few paragraphs is possibly doing it a disservice but my intention is to convey the idea that the premise that Connectibles! is based on is simply the age-old ritual of gift giving. I think it is truly innovative the way that Kalanithi has taken what is very much a product of the day, the social network, or virtual social network application, and through making it tangible, has given it a sense of legitimacy. What I mean by this is that it highlights many of the flawed aspects of web based social networks, in particular the world's most popular social network Facebook, which prides itself on the realistic depiction it gives of a users social circle compared to rival networks such as Myspace. In reality though this is flawed, the mere fact that there is no cost needed to acquire friends and also the visible nature of the 'network' means the main incentive is just to gain more and more friends, meaning that Facebook is more about social capture than social interaction.

Post-Optimisation

Kalanthini has then taken a virtual social network, made it tangible and based the interaction on real relationships, doing this he has created a post-optimal object. A social network such as Facebook is not optimal, but this is what it is striving for. It wants to have the best possible search function, the most advanced filtering system for newsfeeds, the best mail client etc. Kalanithi on the other hand has developed an interface with a slightly surreal, almost childlike appearance, where you can only keep in touch with a small number of your close friends in a subtle, non-obtrusive way such as with a picture that you post in your connectible, or shining a light to show someone that you are thinking about them..

Result of the innovation

This project was only completed in 2007 so perhaps unfair to judge it so soon on the effect it has had, but the response to the project has been very positive. Kalanithi's thesis was published as part of the 2nd international conference on Tangible and embedded interaction held in Bonn, Germany in 2008. In terms of paths to commercialisation, Kalanithi has had some interest from some big corporations, in his own words:

> Well, Hallmark Cards Inc. is very interested in the project, and my (newly-formed) company have already worked with them on paths to commercialisation. I can't really talk about that very much though… and don't expect to see these guys on shelves any time soon
>
> (Kalanithi, 2008)

The interesting aspect in terms of the research is that he has been working alongside commercial enterprises, this does not support my original assumption that industry is working blindly in terms of the development in academia, though in this instance the academic did seek out interest and help from industry.

Kalanithi is not overly confident of seeing his product in its present form in the shops anytime soon though. Unsurprisingly this is very much down to cost. First of all the technology is special purpose, small scale and needs to be very flexible in terms of use, neither particularly conducive elements of mass production. Also the highly treasured nature of the objects in questions means that they must be of a certain quality and each have a uniqueness that is again very hard to produce at a cost.

I think though there is another very important reason that Kalanithi is skeptical about the commercial future of Connectibles! and this is that a post-optimal product such as this requires a radical shift in how consumers believe they should communicate with each other. We as humans have been solely communicating over long distances via voice and text for as long as we can remember and we as consumers have been consistently fed with messages about the most efficient, cheapest, convenient way of doing this. To introduce a product that invites people to use what seems like a device that resembles a family board game that they can communicate with friends using light and colour might confuse people to say the least. This in the world of high-tech marketing would be known as a discontinuous innovation on a huge scale. The way that consumers adopt to such a change and the actions of the stakeholders responsible is key to the outcome of this research and I will go into it in more detail in the next section.

Before I do this though I must introduce the case studies from industry to see how the innovation here, its causes and its effects, differed from that in academia.

2.2 Emotion Communicators (industry)

Product Background & Description

The Emotion Communicators was a product developed as part of the “Vision of the Future” project initiated by Philips in 1995 to explore how products may be in ten years time. The aim of which was to ‘make products and services which come closer to meeting peoples needs and desires’ (Lambourne, 1997). The focus was to combine technology forecasts with socio-cultural trends that were predicted to occur from the mid-nineties onwards such as ethical issues, environmental problems and the fragmentation of society.

Figure 5

The emotional communicators (figure 5) were designed to allow loved ones to communicate an expression of love or support over long distances. Much like the Connectibles!, expression can be communicated in a variety of ways such as sound, visuals, colour, tactility etc. The emotional communicators are very personal objects and would come in many different guises for different users, for example the kids device that could be used for a child to keep in touch with a parent are in the guise of friendly animal characters to be worn around the neck. Again in the same vein as Connectibles! the emotion communicators are designed as objects that would be highly coveted by their users and they would be offered or exchanged as a symbol of emotional commitment, much like a wedding ring.

Post-Optimisation

Firstly the Emotion Communicators are designed so the object itself is the interface, communication is mediated through these strange, almost child-like devices. The focus of communication is not information transfer, like a conventional communication device but it is more about giving reassurance to loved ones

Result of the Innovation

Unlike Connectibles!, Emotion Communicators were developed in 1995 so any resulting effect on commercial development would be easily visible. Though the fact that over ten years later these same communicative problems are being addressed by conceptual products suggests that there has been little diffusion into the commercial arena. What is interesting about the Vision of the Future project is that many of the products developed as part of it have gone onto be developed as commercial products and have very much entered the mainstream of consumer culture:

Such as Shiva (figure 6), a prototype electronic personal organiser based on the assumption that life is going to become increasingly complex and in the future we will want to be constantly “plugged in” and be able to multi-task all the facets of our life through one machine. This assumption has most certainly been proved right and the sheer proliferation of smart-phones, Blackberries and iPhones proves that this concept has found a mainstream audience.

Figure 6

Philips also developed a prototype in-car navigation system (figure 7) in 1995. It perhaps does not bear a resemblance to a modern in-car navigation system but the Philips prototype was spot-on in its prediction of how motorists in the mid-noughties would navigate the roads.

Figure 7

Another key aspect of the Vision of the Future project was wearable electronics; garments with embedded functionalities. These textile materials are able to transport and display data (conductive fibres, flexible displays, embroidered switches etc). It is

interesting that much of this technology has since entered the mainstream of consumer culture. The Philips and Levis collaboration ICD+ (Industrial Clothing Design+), were jackets and jeans (figure 8) that included communication and entertainment functions and were released as a limited edition in early 2000 and completely sold out.

Figure 8

Elsewhere, in outerwear designed for extreme conditions such as ski and sailing wear, integrated clothing and communications that utilise Bluetooth and wifi technologies have become a standard feature, figure 9 shows the Burton Audex snowboard Jacket and helmet with the integrated communication and audio system.

Figure 9

The relevance here to the research is that much of the technology required for these wearable devices such as Bluetooth technology for communication, embedded sensors, conductive fibres etc. are similar types of technology used in tangible interfaces for “emotional communication”, such as the products I have already mentioned. This would suggest that their failure to yet reach the marketplace is not solely a matter of cost if companies such as Levi’s, Burton and Nike amongst others can bring out reasonably low cost products using similar technology aimed at the mainstream consumer.

2.3 Social Mobiles (industry / artistic)

Product Background & Description

Social Mobiles (SoMo) is an exploration of mobile phone behaviour from 2002 that started out as a conversation between the artist Crispin Jones and Mat Hunter, interaction designer at IDEO. Both graduates of the Computer Related Design Masters at the Royal College of Art (predecessor to the Designing Interactions course of which Anthony Dunne is the head of department), Jones was interested in an alternative universe where mobile phones were intentionally designed to be difficult to use. Around the year 2000, mobile phones were at the point of becoming completely ubiquitous but it was still a shock to hear someone walking brazenly down the street shouting loudly into the phone announcing their news to the world. What started out as a study of the actual hardware of a mobile phone soon turned into a study of the antisocial behaviour that mobile phones cause and how design could possibly mitigate or accentuate this. Jones and IDEO collaborated to design five working handsets (figure 10) that in different ways modify their users behaviour to make it less disruptive:

Figure 10

SoMo1 is the electric shock mobile. This phone delivers a variable level of electric shock depending on how loudly the person on the other end is speaking. As a result the two parties are induced to speak more quietly. These phones would be given to repeat offenders who persistently disturb others with their intrusive conversations.

SoMo2 is the speaking mobile. This phone allows a user to converse silently: a person receiving a call in a quiet space can respond without speaking, using simple but expressive vowel sounds that they produce and intone manually. This is the antithesis of text messaging in that it conveys rich emotional nuance at the expense of textual information.

SoMo3 is the musical mobile. This phone requires the user to play the tune of the phone number they wish to call. The public performance that dialing demands acts as a litmus test of when it is appropriate to make a call. Children would take phone lessons in order to learn to play their phone.

SoMo4 is the knocking mobile. The user knocks on this phone to communicate the urgency of their call. The recipient hears this knock through their phone and can be discerning about which calls they answer. Given time people would learn to recognise each other's knocking mannerisms.

SoMo5 is the catapult mobile. This phone can be used to launch sounds into other people's phone conversations. Firing the catapult transmits a sound into the offender's phone. This provides a direct yet discreet way of invading their space. Businesses will supply users with a choice of interrupts to launch from their phones.

(IDEO Social Mobiles, 2002)

Post-Optimisation

Social Mobiles is a good example of a conventional mainstream product, the mobile phone that has essentially been “post-optimised”. All five handsets have a surreal element that invites them to be played with, but what is interesting and indeed the aspect that makes them a post-optimal object is that “play” serves a purpose. Such as a catapult to alert others that they are talking too loudly or knocking louder and

louder to infer the urgency of the call. The handsets are also incredibly innovative and in turn post-optimal, in the way that they allow the user to express their emotions in a non-explicit way. SoMo2 for example essentially adds an expressive element to an otherwise flat medium, the text message.

Results of the Innovation

Social Mobiles was very well received by both the media and the public. Indeed according to Mat, it had some of the best worldwide press coverage of any project IDEO had ever undertaken. Helped no doubt by the huge interest in mobile phones and their place in society at the time, when they were becoming an indispensable item to everyone and their nuisance in society was only starting to become apparent. The project was exhibited at the Japan Media Arts festival in 2003 where it won the grand prize and was recently (2008) displayed at the Museum of Modern Art in New York as part of the Design for an Elastic Mind exhibition.

Despite this large amount of exposure to the public, Mat was quite confident in saying that he felt Social Mobiles has had no effect on the design of mainstream communication devices. This would suggest that these kinds of public displays such as media coverage, exhibitions and awards do little for taking a new type of technology to the mainstream, even from a very well respected design agency such as IDEO. Dunne himself in fact touches on this subject, in chapter 5 of Hertzian Tales, entitled “Real Fiction”, he discusses the relationship of the conceptual product to the commercial landscape and how the conceptual product can “cross-over” into commercial design. One way of doing this is to develop a working prototype that can be displayed to the public in a gallery. The problem with this though is that the pubic are seeing the product out of context; even if they find the work interesting they perhaps might miss the relevance that the product might be able to have to their actual lives. As Dunne explains about visitors to his own Monitor as Material exhibition at the RCA in 1996:

> They found the work interesting as a spectacle, but had missed concerns with the more fictive, social and aesthetic aspects that linked it to everyday life… the gallery became a “bracketed space,” an abstract setting, disconnecting the experience of engaging with the work from everyday life.
>
> (Dunne, 1999 pp.85-6)

I do not believe though that the limitations of prototype products displayed in galleries is the primary reason that Social Mobiles failed to have an effect on the design and interpretation of mainstream communication devices. Nor do I think the primary cause is solely a lack of communication between the conceptual side of the industry and the commercial. The real reason is far more complex and in the next section "The Post-Optimal Object and the Consumer" I will explain what the causes and effects of consumer adoption are. I will then deduce if, how and when, tangible emotional communicators will ever reach the mainstream of consumer culture.

These three case studies; Connectibles!, Emotion Communicators & Social Mobiles have failed to have a real impact on the mainstream communications industry despite having wide scale success and recognition in terms of their achievements. The findings show that this is not the sole responsibility of a lack of dialogue between academia and industry, despite the goals and agenda's within the two institutions being widely different. Industry is aware of what these tangible emotional communicators are trying to achieve, development by companies such as Philips and IDEO shows that. However despite the technological aspects of these devices diffusing into the mainstream, the post-optimal aspect of these communication devices remain in the conceptual world.

Section 3: The Post-Optimal Object & The Consumer

The case-studies described in the previous section have shown that they have not been hugely influential on mainstream communication devices. It is also clear that the relationship between innovation and academia is not the main contributor to this. In this section I analyse this relationship to discover what impact conceptual development really has on commercial electronic products in the present day. I then focus on post-optimal objects that already exist in the consumer landscape to see how concepts such as commoditisation, retail channels and the consumer eco-system as a whole effects the ability of consumers to adopt new technology. Finally I investigate the concept of "the mainstream" and question whether a post-optimal object could ever be considered as such.

3.1 Innovation in Academia & Industry

My original assumption before starting the research was that the academic world and the commercial world were living very much in their own "bubbles", the former focused too much on the future, the latter focused too much on the present. This to an extent should be the case; academia must be focused on both the technological and social trends of the future, developing products that will enhance the quality of our lives. Industry on the other hand has an obligation to produce what is in demand right now to "serve our needs", but the idea, as Dunne himself mentions is that there should be a defined area of "crossing-over". This crossing-over would involve dialogue between the two institutions, designers going back and forth, working in both academia and industry and sharing ideas. Before starting the research it was my assumption that in the consumer electronics industry, this "crossing-over" was very small compared to a traditionally more "culturally speculative" industry such as architecture.

Although I have only focused on a few case-studies, I believe the evidence that I have collected proves that the inability of the post-optimal object to reach the mainstream of consumer culture is not the direct result of a lack of dialogue between academia and industry. Where as I am sure this relationship is not ideal, the fact remains that there is a dialogue, and to an extent both institutions are aware of the same problems. For example, it was interesting to learn that Jeevan Kalanithi had been speaking to corporations about bringing Connectibles! to market and even

more interesting that a corporate design department such as Philips Design was creating a product based on a similar premise 10 years previous. With the media coverage that Social Mobiles had, being exhibited at MoMA and the fact that it was created by such a high profile design firm, the mobile communications industry would almost certainly have been aware of this development, but still it had no physical effect on the industry.

I believe one of the major barriers to the adoption of radical changes of thinking, such as post-optimisation, in the consumer electronics industry is size. The nature of the products being produced, lending itself to mass production means the drivers of the industry are huge corporations and those who make the influential decisions may be far removed from what is going on in the design or research departments. Philips is a good example of this, Philips Design is an independent Design Group providing services to the rest of the Philips Corporation, but the influence that a design group of around 500 employees can have on a corporation of around 130,000 employees, with a strong engineering focus is debatable.

I do believe though that this is changing to some extent. Dunne himself works with industry to “envision products of the future,” and Intel is currently working with Dunne and his partner Fiona Raby to understand such questions as “what are the payment rituals of a cashless society?” and “will we navigate our interactive TV’s by gesture?” They have set their students at the Designing Interactions course at the Royal College of Art, the task of answering these questions with the development of prototypes. An article on this project by Justin McGuirk in Icon magazine, September 2008, features some of the students’ work that focus on the ritualistic dimension of payment, such as Gunnar Green, who devised a series of hand gestures that signified certain values. Others focused on bringing tangibility back to spending electronically, one project by Chris Woebken proposed that if you were paying for an expensive meal, you might swipe your debit card further than for a less expensive meal.

Companies such as Intel, that let designers and students play the role of future casters is certainly a step in the right direction, and I would say important for the company itself as in the world of consumer electronics, investment is very expensive and in the super high-tech world, where Intel is located, innovation and development is a very long process; about a three to seven year commitment to develop a new microchip according to Genevieve Bell (2008), director of Intel’s User Experience

department. Nevertheless many large companies do not have the finances or inclination to have a dedicated People and Practices Research group filled with anthropologists, sociologists, computer scientists and designers. Also there is no guarantee, once the results of a conceptual experiment like this reaches the senior executives, that the company as a whole will act upon it, as Dunne reflects, ‘

> You can’t be sure what Intel will take away from it. You don’t know how something you’re doing can have a commercial or technological outcome. But the assumption is that they’ll find something of value, so we just tried to make the project as rich as possible. (2008)

But I think what this shows, is that at the very least a dialogue between the conceptual development of post-optimal objects and the consumer electronics industry DOES exist. It may not be a perfect relationship but the links are there, and it is up to the commercial designers and manufacturers to add a post-optimal dimension to their products. This is clearly yet to happen in the world of electronic communication devices but there are other products and media where post-optimal elements have been successfully released to the public. I will now investigate these products in greater detail to understand how this can happen.

3.2 Post-Optimal Objects Existing in the Commercial Landscape

As I mentioned in the introduction, Dunne compares the world of consumer electronic products to that of architecture or furniture design that have existed in a state of cultural speculation for some time. Indeed some might even say it is the role of an architect or furniture designer to design buildings and products that make us think differently about the spaces we inhabit, and some architects such as Lebeus Woods and the Archigram group in the 1970’s have made very influential, careers in their field without ever actually building anything.

We can, however, look closer at the world of electronics to find post-optimal objects that already exist in the commercial landscape. The humble radio for instance can be found in numerous post-optimal forms, so commonly in fact we probably wouldn’t even notice it as such. Take the Kosmos Project (figure 11) as an example. The designers Ewa Bochen and Maciej Jelski describe this radio on their website as ‘an object of everyday use that becomes cultic, showing great power of media against

loneliness in the contemporary society and the need of belonging to a community'. This object is "anti-technology", the inner workings are essentially taken for granted and the purpose of the product is on a much richer level than simply its function as a broadcasting machine.

Figure 11

Another example of a simple electronic post-optimal object is the Muji CD player (figure 12). This award winning device by the then IDEO designer Naoto Fukasawa was designed as part of the 1999 "Without Thought" programme, a yearly programme where designers from Japanese companies come together for three days to explore a theme, continuing collaboration on their individual projects for weeks afterward in order to eventually create a model of their idea. That year the goal was to see what people do and feel in their daily lives, and to find designs solutions that are simple, but touch shared senses and memories.

Figure 12

The CD player has a very simplistic form; as the exposed compact disc spins, the device mimics a ventilation fan. This is a classical example of a post-optimal object, taking a formerly “technological” product such as a CD player and making it a lifestyle accessory; a piece of art or just an intriguing object, essentially an object that can be interpreted by many different people in many different ways. The Muji CD player was added to MoMA’s permanent collection and in its first year of sales it made $2.2 million dollars. The Muji CD player was certainly a post-optimal object that entered the mainstream.

The question then begs to be asked; if numerous radio’s, alarm clocks and a certain CD player can be post-optimal and successfully sold to consumers, why not other electronic products, and particularly, communication devices?

3.3 Commoditisation

Quite simply, technology such as alarm clocks, radio’s and CD players are now “commoditised” technologies. By this I mean the technology in these products has been developed to such an extent, that the difference in price and quality between, for example, the “best” CD player and the “worst” CD player, is negligible. The CD player is now an electronic version of rice or wheat, in that it is a commodity, and

referring back to the Connectibles! project this means it has a high use value but little exchange or symbolic value. As Anthony Dunne would say, it has optimised. Once this happens designers and in turn manufacturers have a number of options, to focus on price and make the cheapest CD player possible, to converge technologies so the CD player is integrated into a multifunctional home entertainment system, or they can focus, like Naoto Fukasawa did with the Muji CD player, on creating an object that is more about its aesthetic qualities and the life it mediates than what it technically does. Again referring back to object theory, this turns the CD player from a commodity into a memento that has not only a use value but also a high symbolic value; a true post-optimal object.

Digital communication devices such as mobile phones on the other hand, are by and large a long way from way from optimisation and examples of where companies have tried to introduce aspects of post-optimisation into these products highlight how this is very tricky to get right.

In 2003 Siemens in collaboration with IDEO released a range of “fashion focused” mobile handsets named “Xelibri” (figure 13).

Figure 13

These handsets were designed and marketed on the lifestyle aspect of mobile phone use, as opposed to the technology focus that most handsets have. They were aimed at a very specific audience (Under 24’s, female) and were sold through upmarket fashion / lifestyle retailers such as Selfridges. These phones however did not prove popular and were a flop.

The reason for this is that the mobile phone market has not commoditised yet; a mobile phone is a far more complex product than a CD player, though the “phone” aspect of a mobile has commoditised, the handset itself has not. Consumers are not willing to pay extra for features that are not related to technology and the Xelibri handsets are an example of this. They were designed with a high symbolic value being more important than the use or exchange values, it turns out the mobile phone consumer does not want this yet. The reason why this is so, is partly due to the technology not being far enough down its lifecycle to commoditise, but other factors are also come into play such as marketing and retail channels, essentially all the factors that make up the consumer ecosystem.

3.4 The Consumer Ecosystem

The consumer ecosystem is the circular and evolving lifecycle that the consumer product lives in. This ecosystem involves design, manufacture, retail, marketing and eventually consumer adoption. It is circular in the sense that all the various elements are affected by each other. To illustrate this I will use the example of Xelibri; the traditional mobile phone industry is setup to design, create, sell and market technology, focused phones. The manufacturers design and make tech heavy phones, they are then marketed as such with particular focus on the features, they are then sold through specific technology retailers; either dedicated mobile phone shops or generic consumer technology stores. This informs consumers that when they want to get a new phone, they need to decide which features are important to them, go down to their local mobile phone store and they’re away.

When Siemens decided to do something different with Xelibri, and offer a phone that was based on a lifestyle choice as opposed to a technology desire, they logically decided to change their retail channel, so they sold the handsets in fashion outlets such as Selfridges. This did not work though as consumers were not used to buying what they perceive as a technology item through a fashion retailer. Interestingly what Xelibri did here was right, the key to selling a post-optimal product is to understand that it’s not an object of technology but it is a more of a lifestyle object. The mobile phone industry and its consumers however are far too focused on optimisation at the moment for this to work.

Referring back to the Connectibles! case-study, I explained that due to the radical nature of the product; its focus on subtle communication and the unusual looks means that consumers would have change their views on how they communicate with their friends. The problem for these types of post-optimal products is that they very much support the notion of a digital lifestyle, technology items that exist to enrich our lives, however as I have just explained the retail channels and marketing strategies of the technology companies are not focused on this aspects of electronic products. There have been recent efforts to change this however; Digital Wellbeing is a “lifestyle technology store” setup by two former RCA students that attempts to cater for exactly this market segment, and it has been quite successful. Though they do have the problem that there currently isn’t a huge supply of post-optimal products for them to sell. This again highlights the concept of the consumer ecosystem, that all parts of the ecosystem must be supportive of one another to be effective.

This tells us that tangible emotional communicators do have a place in the world of digital communications, however currently the technology and the industry itself has not evolved to such an extent to allow this to happen. However there is still the question of whether it would reach the mainstream of consumer culture, or would it languish on the peripheries as a niche or collectors item?

3.5 Mainstream or Alternative

There are numerous theories on technology adoption, many stemming from the Technology Adoption Lifecycle (figure 14) that was first developed by Joe M. Bohlen and George M. Beal in 1957 at Iowa State College, that is bizarrely based on tracking the purchase patterns of hybrid seed corn by farmers.

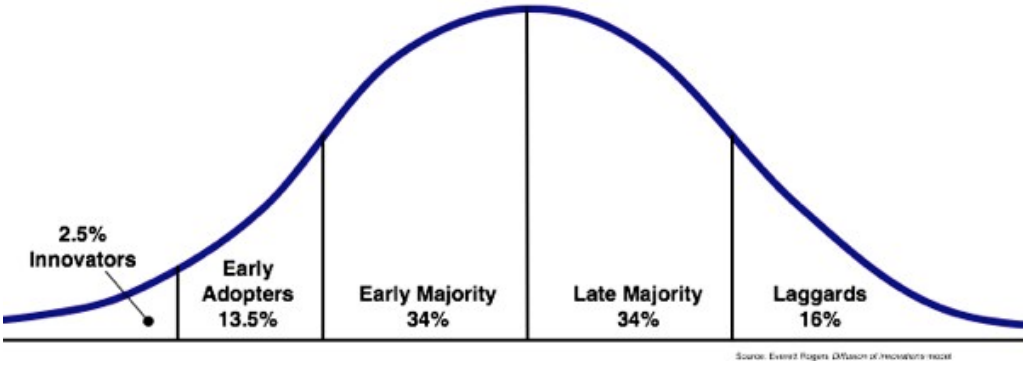

Figure 14

Of interest here is Everett M. Rogers (1962) take on this cycle, Diffusion of Innovation that theorises that innovations spread through society by the innovators and early adopters.

The interesting aspect of a post-optimal object though is that as I have just explained in the previous sections it must be grounded in established technology. However in the case of tangible emotional communicators, these require users to completely rethink the way they communicate with friends and loved ones. For this reason the post-optimal object cannot be easily placed on the conventional technology adoption lifecycle.

If we look at another explanation of technology adoption however, such as “the three phases of adoption” by David Liddle, the head of the Interval Research Group, we can see how the post-optimal object might be located within this. Liddle’s three phases of adoption states that technology generally passes through three phases of users, which have profound implications for designing products at each stage.

I won’t go through each stage in depth but in terms of technology the post-optimal object has to have passed through the first two stages and be firmly in the consumer phase. It is only in the consumer phase when prices fall far enough for everyone to be able to make use of the technology, and the design has been developed enough to make it easy and enjoyable for people to use. I don’t believe the post-optimal object belongs in this core part of the consumer phase though. It is more like as Bill Moggridge envisions it (2007), ‘we can see the “alternative now” proposed by Dunne & Raby as a sophisticated extra layer within the consumer phase.’.

The post-optimal object is an individual item or experience, it is not for everyone, and for this reason I don’t think it would ever qualify, or wish to qualify as a mainstream object. If we look at post-optimal objects that exist in the consumer landscape such as the “tangible” electronic products like the Muji CD player and the Kosmos Project Radio, to the “intangible” objects such as media that focus on quirkyness and non-linearity such the films of Wes Anderson or the books of Roland Barthes. These are objects that no doubt are popular, but the focus on their symbolic value, above all else means that they become mementos, and it is not memento’s but commodities that exist in the mainstream.

The collaborations between Dunne and Intel as well as examples from the case studies show that a dialogue does exist between academia and industry. Despite this not being the healthiest relationship it is clear that this is not the main cause for tangible emotional communicators failure to be adopted by consumers. However it seems that many post-optimal objects do in fact exist in the consumer electronics landscape and studies of these products reveal that the fundamental aspect of a technology in terms of its ability to be post-optimal is that technology must be commoditised. When a technology is commoditised, its cost is negligible and consumers are comfortable using it, so design can be focused on creating an enriching experience as opposed to functional device. It is also important to note that products exist in an ecosystem of manufacturers, marketers, retailers and adopters and for a product to be successful; all must be supporting one another.

Part 4: Conclusions

The intention of this research was to understand the extent to which the relationship between innovations in academia and industry were preventing the post-optimal object entering the mainstream of consumer culture. My assumption was that a poor relationship between these two institutions was the cause of an inability to turn conceptual products into consumer products. In terms of my chosen focus for this research, tangible emotional communicators, I have found this not to be the case. There has been conceptual development in this area by both academia and industry and often in collaboration. This discovery did not solve anything though, there was still the question of why these products, such as my three main case studies; Connectibles!, Emotion Communicators and Social Mobiles were not being developed as, or at the very least influencing the development of consumer products.

A big break through in the research came with the discovery that in fact the post-optimal object does already exist as a consumer electronic, in the guise of radios, alarm clocks and CD players. This showed that there is a market for alternative electronic products as many of these products have been very successful. It also highlighted the concept of a commoditised technology, which creates an equal platform from which designers can experiment with, as Dunne would say, “alternative realities”. Examples of where companies or individuals have tried to create a post-optimal object before a technology has reached this point, such as the Xelibri mobile phone, highlight why this is so. Consumers were not ready to accept a mobile phone as a “non-technology” item, they also did not accept the idea of buying what they perceived as a technology item from a fashion store.

This would suggest that there is a future for the tangible emotional communicator as a consumer product. Though there is still the issue of cost; the unique and personalised nature of these products means that the cost of producing an item such as Connectibles! is so high relative to a web-based social network for example. For this reason the immediate future in emotional and post-optimal communication in general, is more likely to be software based. The reason for this is that designers have an instant platform to work from when creating a web application. This is why we see many post-optimal websites. The problem with the communications industry and in particular the mobile communications industry is the high cost of producing the hardware, i.e. the phones, means that development has been limited to a few large

multinational companies. This is why unfortunately innovative strategies like Digital Wellbeing, a digital lifestyle store, is slightly flawed as there are not enough technologies that are currently in a state where they can be post-optimised it is hard to find products to sell.

Large companies by their very nature are not set-up to produce post-optimal products because their focus is on mass-production and a post-optimal object relies on its uniqueness and personalisation. This is why mobile phone development has been so generic and technology based. However with the introduction of the iPhone and the “app store” and also the soon to be introduced Google Android, the mobile phone has essentially been opened up to individual designers and developers everywhere. This creates a world of opportunity for developing alternative ways of communicating using the same device, and the tactile nature of these devices mean that they could incorporate some of the aspects of the conceptual tangible interfaces that have been developed over the past ten or so years.

In terms of the future of the post-optimal object in general, I believe up to now the development of electronic products in general has largely been focused on hardware, we have a myriad of different devices; laptops, phones, mp3 players, TV’s etc. that we use every day. This hardware, like mobile phones, is expensive to develop and takes a long time to commoditise. This is the reason we have only a few alternative, post-optimal objects from which to speak. However as all these devices slowly get consolidated into perhaps just one or two multifunctional devices that we bring everywhere and use everyday, development will largely be software based. For this reason I believe we will see, feel and experience a lot more post-optimisation in our lives.

Lastly there is the issue of the post-optimal object reaching the “mainstream of consumer culture”. I have purposefully avoided using the term mainstream in this conclusion because I think the post-optimal object, in whatever guise it is in, will never reach the mainstream because by its very nature is alternative, and I think surely this is part of its appeal?

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