

Mutoid

by Elena Leurini

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Abstract:

In this paper, I address and face the problem of the quick obsolescence of digital communication and information devices (DCID). The purpose of this topic is to bridge the gap between technology, people/users and environment. This is because actual designs provide closed systems which don't allow to DCID to have a long life, due to the changeable needs of people and the progress of technology. The consequence of the actual approach is heavy pollution, as we don't know how to dispose DCID after their use.

By this project, I propose to approach the design of DCID as "devices in progress", combining the personalisation of those products to their physical growth. This would allow people to evolve their DCID according to their needs. Such a suggestion is likely to lengthen the lives of those devices and of some of their components, as DCID would carry the story of the owner through their shape.

To conclude I would say that this would empower people to develop a more conscious idea of the value that DCID have in our lives as well as of the consequences that DCID have in our environment, promoting more rational behaviours, therefore a more rational use of resources.

Intro: How can the quick obsolescence of digital communication and information devices (DCID) become an opportunity for design?

How can the quick obsolescence of digital communication and information devices (DCID) become an opportunity for design?

Nowadays, many different DCID exist, even though many have the same components

and functions. They allow us to interact with each other and to entertain ourselves, thus we recognize them as necessary. However, they are not designed in order to have a long life because they are closed systems. Thus, average users take for granted their quick obsolescence and tend to look forward to the next new model, in order to get better technology. Furthermore, DCID are very polluting and as, after their use, we don't know how to dispose them, Western countries export them elsewhere in order not to face the problem.

There is a design opportunity in "modular design", as it can bridge the gap between technology, people/users and environment, by making functions perceptible and to provide an open system. In this way, the design of DCID would adapt to people's needs as the dedicated parts would be approached as interchangeable units, offering the chance to develop personalized and physical up-to-datable portable devices. I think that such a change of direction in DCID design is necessary because, since "eighty percent of the environmental impact of the products, service, and infrastructures around us is determined at the design stage"¹, the quick obsolescence of DCID is a problem of design.

Chapter 01: The intrinsic paradox

No one does wrong willingly, but it's unwillingly that all who do wrong do wrong.
(Socrate, The Georgias)

Why the so called convenient lifestyles, which are supposed to simplify our lives, tend to deeply damage the only world where we can live as well as to broad differences amongst people's lifestyles?

During my research, I've found very interesting to discover that such a practical problem is hard to address even on a philosophical level. This is because if, on one hand, this specific historical period is identified as the one of communication, due to the quick spread of the use of communication devices in everyday life, on the other hand, DCID don't communicate easily with each other, as companies make use of different connections in the sake of cheap competitive production. Thus, communication devices struggle to "get along" with each others (device with device), with users (who get stressed out by using them) and with the environment (pollution). Indeed, those devices don't cooperate with each other, because they are not compatible amongst themselves on both micro and macro scale. Basically, companies apply technology to design DCID as closed systems, which cannot be updated on a physical level; at the same time, DCID are designed for people, who evolve all the time as well as technology does. This contrast generates the obsolescence of DCID and the ecological consequences that such design approach brings along.

¹ Thackara, J., 2005, *In the bubble: designing in a complex world*, The MIT Press, Cambridge.

01. A_ DCID as catalysers of human relationships

In 1967 Marshal McLuhan wrote the first edition of "The medium is the message" where he writes about his innovative and critical theory about the rule of media on people and society:

"All media work us over completely. They are so pervasive in their personal, political, economic, aesthetic, psychological, moral, ethical, and social consequences that they leave no part of us untouched, unaffected, unaltered. The medium is the message. Any understanding of social and cultural change is impossible without a knowledge of the way media work as environment."²

In the era of communication, what do people like or dislike about DCID and how do they tend to relate to them? How has our environment evolved?

In order to understand today environment and behaviours, I have been researching around this topic by sending out questionnaires by e-mail. This is because I needed to enter in people's houses in order to comprehend their lifestyles and collect visual material about; using e-mail, I could ask them to attach pictures that they would have shot, and at the same time they wouldn't perceive me to be too invasive. Furthermore, I needed to contact people with specific characteristics, such as living in the same house for a long time and their age. Indeed, those features were important to me for different reasons. The first one would have given me the possibility to have more visual material as there was the bigger chance that my users could have collected their (obsolete) devices over time. While, their age was crucial in order to have a wider vision of the use of technology and of the changes it brings, as well as to explore possible developments and changes of human habits. In line with it and considering that the massive popularity of DCID has spread during the last ten/fifteen years, I've approached ten people/users that can be categorized in two groups: the first one is between 22 and 30 years old while the second one is between 55 and 60 years old. This is because on one hand, those two generations, are the one which lived the transformation that DCID brought on a daily base; on the other hand, the two groups approach the use of DCID in a different way because of the different environment they have been experiencing throughout their lives.

My second question was: Which communication and information device do you use most?

"Mobile phone, this is because I work in a Multinational company within a distributed team, thus the use of the mobile phone is a need I cannot avoid" (participant n°6, male, 55 years old);

"The PC (the net), this is because it is communication and information at once" (partecipant n°2, female, 28 years old);

"The PC, this is because I can inform myself and hear from my friends, but this is only if I am at home and if the PC is already on, otherwise I use the mobile phone in order to hear from my friends" (participant n°1, female, 22 years old);

"The PC, this is because it is the extension of my memory, container of documents and deferred mean of communication" (participant n°7, male, 59 years old);

"I would love to be romantic, but I cannot help it! The mean of communication I use the most is the telephone, both the fixed one and the mobile phone... either weather it is a normal chat with a friend or a chain of information or a discussion about something..." (participant n°3, female, 22 years old).

By those answers, I turned to understand that what people like most is to hold human relationships. Because of that, digital devices tend to be very popular by shortening space and time amongst people. Furthermore, those which give the sense of allowing and increasing human contacts are the most used as well as the most popular.

"I use with most enjoyment the telephone because I speak to people and I feel I have more human contact" (participant n°5, male, 23 years old).

However, those sorts of devices are also likely to become obsolete faster because people are willing and happy to switch their electronics, as long as they give them the feeling to increase human contact.

"I stopped to use my fixed telephone to communicate with people abroad since I use Skype, because it is for free and, through the webcam, it gives me the chance to interact visually as well" (participant n°2, female, 28 years old).

This sense of belonging, that appliances feed, deals very directly with the fast performances that they can provide, because they can work almost as fast as our brain, providing different opportunities and fields of action at the same time.

"I use with most enjoyment my PC, because it allows me to open several windows on the world at once" (participant n°4, male, 29 years old);

"I use with most enjoyment the telephone, because it is immediate" (participant n°9, female, 56 years old);

"I use with most enjoyment my PC, because of internet and e-mails. Indeed, the e-mail is the mean of communication that I use with most enjoyment because it allows me to share a big amount of information's with several people at once and quickly as well as to keep the shared information's. While internet is the mean if information that I use more often because of the easy access as well as the quickness of answering" (participant n°6, male, 56 years old);

Thus, we have the feeling to be free, to have the chance to choose, to express ourselves in our complexity as well as to share it all, if we feel like it.

Moreover, the active presence of those devices in our lives is due to the fact that they are human-sized, thus we can carry them around. Therefore, also on a physical level, they turn to be closer and closer to ourselves.

“When I go out I carry along my mobile phone and my I-pod and I usually place them in my bag” (participant n°4, male, 29 years old);

“When I go out I carry along my mobile phone and my MP3-player and I usually place them in my pockets” (participant n°1, female, 22 years old);

“When I go out I carry along my mobile phone I place it in my pocket” (participant n°8, female, 52 years old);

“When I go out I carry along my laptop and my mobile phone. Usually, I place the first one in my bag and the second one in my pocket” (participant n°10, male, 57 years old).

We allow DCID to follow us, in order to have entertainment as well as to be linked to the surround world. This doesn't happen only when we go out, but also at home, where we tend to place the portable devices close to us or in places where we pass often through.

“When I am at home, I place my mobile phone on the fridge or in the corridor” (participant n°9, female, 56 years old);

“When I am at home, I place my laptop in my storage closet, while my mobile phone... wherever” (participant n°6, male, 55 years old);

“When I am at home, I place my MP3-player on my desk as well as I do with my mobile phone...which often I also place next to the fixed telephone, in the corridor” (participant n°5, male, 23 years old);

“When I am at home, I usually place my I-pod in the draw of my desk and my mobile phone next to my bed...but I have to admit that I tend place them wherever, according to the day” (participant n°4, male, 29 years old).

This shows that, also at home, we tend to rely on their portable size. Indeed, the combination of DCID's functionality to portability is the real feature that links us to them; they are the extensions of our body, as McLuhan pointed out:

All

media

are

extensions

of

some

human

faculty-

psychic

or

physical.^{2a}

Also one of my users defined the PC an extension of his memory; thus, we tend to consider them direct and active links to the world. Therefore, we need them in order to have the feeling to be part of the community. In particular, this is a tendency much stronger with the younger people rather than with the mature ones, because adults seem not to rely so deeply on digital devices:

"There is no DCID I enjoy to use...while I do love walking with my dog and free mind" (participant n°7, male, 59 years old);

"When I go out I carry along my mobile phone, but it's usually off" (participant n°8, female, 52 years old).

This makes me wonder if this sense of independency that DCID provide to young generations tends instead to provide the opposite as well as the incapability to be in silent on our own for a little while.

As the use of DCID is becoming more and more rooted in daily Western people's lives, I think that it is also interesting to wonder to which extent this process ends up being more an "enemy" or more a "friend" to people, to use Neil Postman's words. Indeed, in the introduction of "Technopoly", he describes technology as an enemy as "it undermines certain mental processes and social relations that make human life worth living", and at the same time as a friend as "it makes life easier, cleaner and longer". However, in today's context, both his definitions can be argued. This is because Postman's idea of technology as "enemy" has been denied by my interviewers whom about DCID tend instead to claim the opposite. While if one looks at his concept of "friend" on a bigger scale, the result is that DCID generate pollution which tends to make life more difficult, dirtier and shorter.

01. B_ DCID as E-Waste

Greenpeace reports that "The world is consuming more and more electronic products every year...This has caused a dangerous explosion in electronic scrap (e-waste) containing toxic chemicals and heavy metals that cannot be disposed of or recycled safely".

Nowadays, the problem of environmental pollution is louder and louder, as the environmental consequences of it are becoming perceivable. However, those ramifications stay still hard to forecast, approach and manage. For these reasons, Western society is getting scared and its lifestyle attitudes are shifting toward more ecologically friendly approaches. In this regard, many companies

^{2a} McLuhan, M., and Fiore, Q., 1996, *The medium is the message*, 3rd, Gingko press, Corte Madera.

are facing legislation changes which address different production methods, which include avoiding the use of toxic chemicals and encourage recycling materials after their use.

In particular, electronics are considered amongst the most polluting products, as they have been produced using dangerous "ingredients". Indeed, production methods which avoid the abusive implications of toxic materials and which consider disassembling processes after the use are becoming more prevalent in today's society due to their lesser environmental impact. This is because it leads to easier and cheaper possibilities of recycling or reuse in order to have a more rational use of materials. Several designs show that this is already a reality.

"Fortunately for human nature, in most cases change begins with a specific product, system, or problem and, driven by a commitment to putting eco-effective principles into action, grows incrementally. In our work, we have observed companies of all sizes, types, and cultures in this thrilling process of transition, and we have had ample opportunity to witness the steps they go through as they begin to retool their thinking and their actions in service to an eco-effective vision."³

However, if the problem of pollution is also connected to the fact that people tend to consume more and more electronics, the solution doesn't lay only around the nature of materials, but also around the amount of products consumed as well as understanding better people's behaviour in relation to DCID.

Chapter 02: Eros and Thanatos

The way in which we tend to perceive, relate and use objects is framed and addressed by their design itself in the whole lifecycle of products. For this reason, I think that there is a design opportunity in the field of DCID according to the paradox that people can grow much attached to their mobile devices, but they change them quite often in order to get better technology. The state of the art shows indeed that, while the devices are designed as closed frozen systems, people, as well as technology, are open systems that progress and evolve over time. This contrast causes the fast obsolescence of the devices in pursuit of the changeable needs of people and to the progress of technology.

02. A_ The lifecycle of DCID and people's attachment

The first question I have addressed in my questionnaire was wondering which object they would bring with themselves and why, in case of an extreme situation such is fire. This was in order to understand the way in which they tend to apply value to objects. Of course, the answers were very different each others, like the following examples show:

"My cello, because it's the most precious thing I own" (participant n°2, female, 28 years old);

³ Mc Donough, W., and Braungart, M., 2002, *Cradle to cradle: Remaking the way we make things*, North Point Press, New York.

"My blanket, because it can avoid burns, thus save my life"(participant n°9, female, 56 years old);

"My glasses, because thanks to them I won't stumble and die in the fire"(participant n°7, male, 59 years old);

"My backpack, probably because it's the closest object to the front door and it is where I always keep my documents, home keys (which even if it's burning, you never know, they might still be useful), walkman and crayons" (participant n°3, female, 22 years old);

"My laptop, because it is the necessary tool I need for my job. Furthermore, it contains all the company's and private information's"(participant n°6, male, 55 years old).

Those answers let me understand that people tend to connect to objects which represent part of themselves or to those which guaranty them a sense of independency and safety.

"Design decisions shape the process behind the products we use, the materials and the energy required to make them, the ways we operate them on a daily basis, and what happens to them when we no longer need them."⁴

DCID are participating links to the surround world, thus DCID tend to move in people the necessary feelings to let users connect to objects. Indeed, DCID feed the sense of independency and security, because people can contact each other wherever they are.

At the same time, DCID represent part of our self as they memorize all our contacts and data's, thus they acquire our environment, our context. However, as DCID don't develop, they end up to represent only a portion of time of people's lives, being focussed on people's past rather than on people's evolution or future. Furthermore, technology developments tend to provide communications platforms closer and closer to natural human behaviours, which make new devices more and more desirable.

"I don't use tapes anymore. I go for CD's instead, because they are thinner and lighter; furthermore, they allow me to listen to the track I want when I want" (participant n°1, female, 22 years old).

Those are the reasons why people tend to switch their DCID even if they still work, when it doesn't matter anymore if it means to copy all the data they need from the older device to the brand new one and to find the space to store the obsolete device or to give it away.

A possible solution that design could offer in order to suggest to people different behaviours toward DCID is in the combination of the whole lifecycle of the product with the development of the attachment of people to the devices. It's not just a physical matter but also an emotional one. The way in which we

⁴ Thackara, J., 2005, *In the bubble: designing in a complex world*, The MIT Press, Cambridge.

tend to perceive and relate to them is indeed a crucial point for a different approach to DCID use.

According to that, I assume that an alternative approach to the design of DCID can lead to lengthen their life as well as give different suggestions for their use.

02. B_ The personalisation of function and use

Nowadays, DCID are perceived as personal mass production pieces which tend to be personalised by their content (contacts and data's) and audio and visual gadgets which can be added on. However, those gadgets don't add any extra performance benefits, but instead usually duplicate functions. For example, people plug in their mobile phones headphones and microphone in order to let the device be more suitable to their needs, when the device is already equipped with them. In this regard, I suggest a different approach which could lead to the effective personalisation of DCID function and use.

My proposal is to combine the personalisation of functional parts of the DCID to the growth of the device. The result of this combination leads to the design of a "device in progress". This means that the appliance evolves as an organic object, adapting to the changeable needs of the owner, carrying the cycle of the development of the person through the sum of the new performances. Furthermore, by progressing in this manner, the device will change itself, not only in its functionality but also in its perception, in order to communicate itself in a visual way. This feature is likely to address people, by making them more conscious about the parts which compose the device as well as the value of these parts in terms of their usability and performance.

In addition, as people "wear" portable devices and "the integration of wires and electronics into textiles (e-textiles) has many potential applications for wearable and pervasive computing"⁵, my design will be made out of e-textiles. The combination of "electronics with textiles would enable pervasive computing to blend into the background so that the user can go about a normal routine"⁶, as textiles are already part of our environment. This means that, potentially, this device is likely to respect the locality as in any place there are local textiles.

I believe that such an approach will lead people to have a more personal and intimate relationship with their devices in addition to a more rational use of resources on a universal level.

02. C_ A more rational use of resources

(Footnotes)

⁵ Lehn, D. I., Neely, C.W., Schoonover, K., Martin, T.L., and Jones, M.T., 2004, *e-TAGs: e-Textile Attached Gadgets*.

⁶ Lehn, D. I., Neely, C.W., Schoonover, K., Martin, T.L., and Jones, M.T., 2004, *e-TAGs: e-Textile Attached Gadgets*.

The idea of the design of a “device in progress” suggests considering the appliance as a system, composed by several components, rather than as one whole piece. According to that, people would perceive DCID as a composition.

Such a perception not only would allow avoiding repetitions of gadgets, but also not to dispose the whole device once it has become obsolete. Indeed, the systemic approach would rather lead to let people choose if to change or to add on units in order to physically update their DCID, instead of purchasing a brand new one. The consequences of such a shift in behaviours will drive towards a strong improvement in terms of waste, as any components can be kept and the performances can be improved or by adding dedicated parts or by substituting the single specific obsolete one.

Furthermore, the use of e-textile as support for DCID seems to be more environmentally friendly as well as more sustainable in terms of costs:

“Copper is the most common electrical conductor, but as with most metals, it can be heavy, expensive, and breakable. In contrast, conductive fibers provide a lightweight, flexible alternative to copper wiring...Conductive fibers can also reduce the cost of metal wiring...NASA partnership within the high-tech textile industry have advanced development and manufacturing processes, increasing output while reducing cost”⁷.

Another very important factor is the portability of the device. Indeed, nowadays they are pocket sized, but they always need a location in order to charge them up and make them usable, thus they turn not to be portable for real. In this regard, many studies around “green” energies are being carried out in those days, which are very promising for future applications. Beside this, there are many studies also around wireless energy transfer, which is very likely to be soon applicable. According to that, my device could work like an animal, which feeds itself on its own.

In line with this, the “device in progress” presumably “gets along” better with both people and environment. This is possible thanks to the alternative structure which enables it to develop a different architecture of DCID’s which slows down the process of obsolescence while some pieces last longer.

Chapter 03: Modular design

“Electronics products often have a hierarchical modular structure organized in a tree like manner with roots that are connected to sub-roots and sub-roots connected to other sub-roots and leaves...One of the characteristics of such structures is that the common modules and components together with other modules and components can be used to form new products with completely different structures”⁸

⁷ Nasa, ***Not-So-Heavy Metal: Electrical Conductivity in Textiles***, [online], http://www.nasa.gov/vision/earth/technologies/electric_textiles.html

⁸ Lambert, A.J.D., and Gupta, S.M., 2002, Demand-driven disassembly optimization for electronic products, *Journal of Electronics Manufacturing*.

03. A_ Interaction of a system with a bigger system, with a bigger system...

The research carried out with technical people was aimed to understand how electronics are build up and how they work. In order to reach my purpose, I've been contacting personally professional people in the field of technology such as E.A., a computer scientist, L.M., a micro-electronic engineer, A.J.D. Lambert, a teacher of management technology, expert in disassembling of electronics devices, at the Technical University in Eindhoven and FabLab, a small scale workshop with the tools to make almost anything. This has allowed me to know and comprehend limits and possibilities of components and systems. We can refer to systems, when more components are connected together in order to accomplish a certain task. It can be a circuit, a printed board, a mobile phone or a PC. In order to have an information flow, it is necessary a strong connectivity amongst the devices.

The state of the art shows that the components are both physical (the processor) and virtual (the software). The combination of the two allows the system to work, where the software is the flexible element which defines the function. This highlights the strong dependency that electronic appliances have towards technology developments. Indeed, this is what defines their design, performances, consumption, weight and dimensions and the reason why they tend to become obsolete easily. Nevertheless, their degeneration is also due to the fact that, nowadays, popular digital information and communication devices are structured on a hierarchic frame. Therefore, interchangeable modules are a valuable possibility to longer the life of electronics. Two of my consultants pointed me out the possibility to have a different, no-hierarchical architecture of those sorts of systems. A.J.D. Lambert described it with the metaphor of a foot-ball team, where there is not a central unit and the parts are programmed for one common purpose. Like the example shows, repetition is not always bad; the repetition of brains is good as well as of functions. The latest is the one which would define the scale of the system itself.

This means that a different way to represent the concept of "containing" as well as "connecting" can lead towards a more flexible conception of digital communication and information devices. Perceiving each component as a system which interacts with a bigger system, which interacts with an even bigger system, allow me to think that it is possible to design more sustainable devices through the personalization of function and use in individual and sharing contexts.

03. B_ A different approach in DCID use

Nowadays, DCID are perceived as personal portable pieces through which people receive, keep and share information's. However, the way in which DCID work doesn't reflect action and behaviours of people as DCID work according to their own vocabulary. In this regard, DCID could facilitate people to understand their performances by combining behaviours to functions, in order

to reflect people's natural actions into commands. By doing that, DCID functions can be translated into people's actions, suggesting a body-visual language which bridges the distance between known and unknown.

On a practical level it means that, in order switch on and off the device, it's possible, for example, to have two points to join or to attach to each other, while in order to raise or bring down the volume there is, for example, something which goes up and down. As well as in sharing situation, the dimension of the output can physically grow, thus that the act of sharing becomes more explicit and enjoyable and the functions can more easily change according to the different situation people live in.

Furthermore, as when people use DCID, they wear them, then my device would propose a way to carry it around in a way which is more related to people needs. In this way, not only it would be harder to loose or to let it be stolen, but also it would suggest different way to carry it around.

Such a different way to deal with devices is likely to give a different view to people of what those devices mean to us and to the community. Hopefully, it will result in a greater understanding of the affective and social value that they have for people in the individual as well as in a social intercourse and in a lower production of waste.

Conclusion:

A cooperative world is possible

To conclude, I would say that I see design opportunities in a deeper understanding and portability of those devices. Indeed, people tend to change them so very often because they consider them only in pursuit of the activities that they allow to. Because of that, people find DCID easy to change.

A system such I have described above, could induce to a more interactive, democratic and rational use of the devices, because it suggests an alternative way to approach the whole DCID's lifecycle. This is because nowadays those sorts of devices are systems composed by several components which are usually hidden and cannot be updated physically. Thus, a DCID which shows off the amount of components that it contains and which let add new dedicated components on is likely to have a longer the life by carrying, through its own shape, the communication of what it is and part of the identity of the owner. Such an attribute is likely to lead to a different way to use it and to link people to DCID, in both individual and social situations.

Indeed, the act of letting the people understand the way in which devices work would provide a platform which will help people to perceive better their effective needs and reconsider devices through a long lasting relationship, thus a deeper emotional attachment. Such an understanding could contribute to use resources in a more rational way, bringing significant consequences on the surround environment by bridging the gap between device-device, device-user and device-environment.

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