FROM techNEWlogy TO techNOWlogy: PROTOTYPES COMMAND THE TROJAN HORSE

Enrique Encinas
SPIRE
Mads Clausen Institute
Southern Denmark University
+4522533233
enenc12@student.sdu.dk

Konstantia Koulidou
SPIRE
Mads Clausen Institute
Southern Denmark University
+4520899599
kokou12@student.sdu.dk

ABSTRACT

This paper presents prototypes as a viable alternative to mainstream consumer products in order to tackle diverse environmental and social issues. Such issues are portrayed under the light of knowledge and acquisition asymmetries boosted by today's consumerist culture. The terms techNEWlogy (technology as innovation) and techNOWlogy (technology as solution) are coined and related to products and prototypes. Finally, examples of techNOWlogical prototypes, known as Knittstruments, are presented to illustrate how prototypes challenge asymmetries and anchor users to the ongoing practice of a certain activity by technological means.

Categories and Subject Descriptors

D.2.2 [**Design Tools and Techniques**]: Evolutionary prototyping.

General Terms

Performance, Design, Economics, Experimentation, Security, Human Factors, Standardization, Languages, Theory, Legal Aspects, Verification.

Keywords

Knitting, Prototypes, techNEWlogy, techNOWlogy, programmed obsolescence, design, consumerism, Trojan horse.

1. INTRODUCTION

The western world lives in the age of possibility. Our culture, regulated by capitalism, has found in economy a science to govern its evolution, a reason for its unstoppable advance. But the earlier Capitalism born after the Industrial Revolution has turned into Consumerism, a social order in which the purchase of goods is the main essence of its existence. This paper focuses on how consumer culture boosts asymmetries in knowledge and acquisition and how prototypes, aside from lessening the impact of such asymmetries, behave as a subterfuge that transforms consumerist technology as innovation (tecNEWlogy) into technology as solution (tecNOWlogy). Finally, this text presents the Knittstruments as working examples of techNOWlogical inventions.

Paper presented at SIDER'14

Royal Institute of Technology, KTH, Stockholm, Sweden

2. ASYMMETRY IN ACQUISITION. A tecNEWlogical SPARTA

In the Aeneid, a latin epic poem by Virgil [1] the trojan horse is described as a technological artefact employed by the Greeks to finally conquer the city of Sparta after an unsuccessful 10 year siege. The Greeks built a gigantic wooden structure resembling a horse (a military prototype?) and hid inside a group of their best warriors. Immediately, all the Greek troops left the battlefield only leaving behind the horse unattended. The tale recounts how the Spartans, sure of their victory, kept the horse as a trophy. At night, once the artefact was resting within the Spartans walls, the Greek warriors crept out of the horse and opened the doors of the city to the Greek troops, which have returned silently under the cover of night to assault Sparta to end the war.

Under a certain perspective, this epic metaphor of war and audacity could possibly resemble nowadays situation regarding today's globalized economy, in general and the role technological products play in it in particular.

Stewart Brand once said "a building is not something an architect finishes when its built, its something he starts" [2] in order to criticize the prevailing practice of certain modern architects not concerned with the evolution of the building after people started to make use of it but only with the final aesthetic result once the construction was finished. It is clear that the same principle applies to a large part of consumer products. Designers focus their attention on building an object that will meet their customer's expectations. By means of diverse user studies and prototyping the final product is delivered for customers to purchase and evaluate, but not to modify. The same way a house is modified according to its inhabitants needs and situation, products evolve with time and use and hence modification by the customer is necessary if the product is expected to fulfill its function satisfactorily. This unbalance between customers needs and the manufacturing industry is the first facet of what we refer to as "asymmetry in acquisition". Would Sparta have been conquered if

the Greeks had not improvised, and had just manufactured famous weaponry? Under certain circumstances, only the modification of an existing product will solve the problem.

The second facet of this asymmetry can be observed while examining the mechanics of modern shopping culture. Products are designed for "fictional" customers and then displayed in shopping centers (virtual shopping centers when referring to software products) for "real" customers to purchase. This misalignment between product and customer often results in dissatisfaction on the client side and diverse loses in the retailer´s when the expectations deposited on the development or the purchase of the product are not met. The third aspect of the asymmetry is commonly known as programmed obsolescence. The Economist [3] defines this approach as "a business strategy in which the obsolescence (the process of becoming obsolete— that is, unfashionable or no longer usable) of a product is planned and built into it from its conception." This is done so the consumer feels the need to purchase a product before it is technically necessary, hence increasing production and economical benefits for the manufacturer. Numerous examples of such practice can be found through history being most famous the case of the light bulb, a product marketed in 1924 as lasting for 2500 hours and two years later, its advertisements displayed a mesmerizing 1000 hours, while patents of light bulbs lasting for 100000 were filled that same year (an example of this ever lasting light bulbs is the illustrious Centennial Light in the Fire Dept. of Pleasanton California, a light bulb that has been shining for more than a 110 years [4]). Aside from the negative impact on customers' ability to purchase products that meet their expectations, planned obsolescence has devastating environmental consequences that can be observed in countries like Ghana, literary flooded by electronic waste [5]. Technology's main goal is to help the owner accomplish a task in a particular moment and not, as it may seem through the lenses of consumerism, substitute a previous obsolete solution that could already accomplish the aforementioned task. We wouldn't be mistaken if we ascertain that technology is nowadays tecNEWlogy, a unsubstantial form of consumerism that applies to the majority of devices.

3. A HISTORY OF techNOWlogy THROUGH PROTOTYPES

In 1660, Robert Boyle created the air pump, the first prototype in the history of science. Intended to demonstrate the existence of vacuum, this artifact challenged the prevailing aristothelic and axiomatic theory of knowledge acquisition and transformed the means of knowledge production. Prototypes entered the scientific scene when, through the XVII, XVIII and XIX centuries, experimentation was carried on by gentleman in their own houses with their particular methods and later published in their own terms (Figure 1). Technical journals were born and science took a turn from previous strictly theoretical approaches into more observational and experimental practices [6].

Prototypes acted as work in progress technology ready to respond to the functional demands of its creators. The were not simply "better" but useful, they were of course new but that was not their goal, their main focus was on responding to the scientific needs of the present. They were TechNOWlogical instead of TechNEWlogical.

In the 21st century, science is again evolving into what is known as the culture of prototyping, a new sociotechnical paradigm where prototypes act as a fundamental tool for knowledge generation and sharing. As Rheimberger points out, "there is a shift from experimental systems to cultures of experimentation" [7] with prototypes having the capacity to act as aiding tools in diverse academic and commercial processes but also as art pieces or fertile "home-grown" alternatives to commercial products.

Reflecting on the success that some prototyping initiatives are achieving, it is possible to affirm that prototypes will increasingly impact shopping culture, as we know it. 3D printers, laser cutters, Arduino, Linux, the tools available seem unlimited to any particular user, will the client employ its own creation instead of purchasing the commercially available one? How will the market react to this shift in sales? Are prototypes effectively able to represent a solution (techNOWlogical) rather than just an upgrade (techNEWlogical)?

Figure 1. Joseph Wright's "Experiment on a bird in the pump"

4. THE LOGIC BEHIND A PROTOTYPE IS techNOWlogical

Defining the prototype with a close statement that embraces its full meaning within the culture of prototyping is not an easy task. A prototype is commonly seen as the early stage of a product that needs to be improved before its commercial release. But prototypes not only act as the entrance hall to the market, their potential and characteristics allow their users to reach goals that final products are not capable of attain.

Broker [8] remarks the explorative ability inherent to prototypes when states that "prototypes act as heuristic artefacts that allow designers to explore socio material alignments between users and technology". Indeed, prototypes behave as magnificent tools for exploring, rather than tools for finding, stating or concluding.

Today's experimental practice is therefore dramatically challenged because it assumes there is an asymmetry in knowledge. Reality ("the natural world") owns knowledge that is hidden to human wisdom till it is discovered and proved by science in a theoretical or experimental environment. There is an asymmetry between what "humans know" and what nature owns. The scientist/researcher tries to compensate this asymmetry by discovering; hence, knowledge becomes symmetrical both in the

so-called "real/natural" world and the "human" world. Prototypes, on the other hand, challenge this notion of symmetry by assuming multiple realities that don't have to be discovered, but that have to emerge. The philosophy behind its existence keeps a comfortable distance with mere consumerist logic. A prototype responds to the present while it functions and is able to be tuned to that present accordingly. Their logic is hence techNOWlogical. Just as Alfred Gell referred to "traps as artworks and artworks as traps" [9], prototypes operate as "knowledge traps" permanently ready to hunt wisdom in unexpected forms.

Every prototype may display very different characteristics but there is one common to all: incompleteness. The permanent "under-construction" state that prototypes are suspended in, awards them with the ability to represent knowledge in a broader way. Prototypes not only embody a final idea, but also a process, a space and a method. Leaning on a concept coined by John Tresch, prototypes may well be defined as Cosmograms [10]: a representation made by the holder of a worldview, of that worldview.

5. KNITTSTRUMENTS: MELODIES OF WEAVING

Knitting is loaded with tacit knowledge that speaks to us through our hands. It is both a material thing and a process. If we observe knitting we can see the workings of a special logic of assembly between the two knitting needles and the thread following certain protocols. The rhythmic slow process of creating a knitting piece reflects also the individuals' embodied knowledge and the degree of skilled practice. We use the term knitting composition rather that knitting structure to leave room for improvisation in the definition that Tim Ingold provides for the latter. "Knitted structure is an outcome of repeated, controlled movement in the process of spinning and looping" [11] Needles, yarns and the knitters' expertise are the instruments to complete a knitted composition. How knitters can translate their embodied skills into new practices directing perception and action through auditory feedback is the goal of the Knittstruments.

As a experimental setting, a breeding between a traditional knitting club and a musical live performance was selected. Participants (Danish experience knitters of all ages with little or no musical experience) had to first familiarize themselves with the Knittstruments (in essence, a drum set, microphone and a Theremin carefully tuned to respond sonically to the movements knitting demands) to later adjust their skilled practice in the creation of rhythmic patterns. The Knittstruments seemed to modify the participant knitting habits by incorporating auditory feedback and hence, rooting them in a new, and very techNOWlogical, present moment of practice (Figure 2).

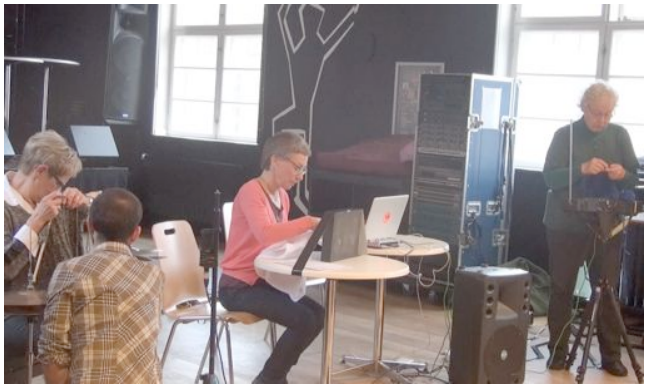

Figure 2. Knitters weaving melodies

6. CONCLUSION

Initiatives aligned with the principles of the culture of prototyping have marked an end to predominant asymmetries in knowledge and have the potential to exceptionally transform the popular shopping culture.

User experience and satisfaction will be remarkably improved once the customer abandons its passive role towards purchasing and becomes aware of the design and manufacturing process of techNEWlogical products and starts acting as a cooperative techNOWlogical prototyper. The challenge is for society to embrace and adopt these initiatives. It is clear [5] that a world of sustainable growth is a utopic marketing campaign with tragic environmental and social effects. A global tendency that is being shifted towards a more ethical and environmentally compromised model not with the help of techNEWlogical products but with the push of techNOWlogical prototypes.

7. ACKNOWLEDGMENTS

Our most sincere thanks to all the team within SPIRE, specially Robb Mitchell and Jacob Burr, Sanita Dzalbe, Asun Pollos and all the pro-amateur knitters that lovingly made this paper possible.

8. REFERENCES

[1] Virgil. *The Aeneid.* Trans. Robert Fitzgerald. New York: Everyman's Library, 1992. Print.

[2] Stewart Brand "How Buildings Learn: What Happens After They're Built", 1994. ISBN 0-670- 83515-3

[3] Idea:Planned obsolescence - The Economist – Mar 23rd 2009 - as seen on 3rd of Jan 2012 -> http://www.economist.com/node/13354332

[4] Accessed on jan 4th 2013 -> http://www.centennialbulb.org/cam.htm

[5] Cosima Dannoritzer 2010 "The Light Bulb Conspiracy – The untold story of planned obsolescence" Produced by Media 3.14 & Article Z.

[6] Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life S Schaffer - 2011 – Princeton University Press

[7] Rheinberger, Hans-Jörg. 1995. “From Experimental Systems to Cultures of Experimen- tation.” Pp 107-122 in Concepts, Theories, and Rationality in the Biological Sciences, edited by G. Wolters, and J.G. Lennox. Pittsburgh: University of Pittsburgh Press. The Second Pittsburgh-Konstanz Colloquium in the Philosophy of Science, University of Pittsburgh, October 1-4, 1993Forman, G. 2003

[8] Bødker, S., & Grønbæk, K. (1991). ‘Design in Action: From Prototyping by Demonstration to Cooperative Prototyping’ in J. M. Greenbaum & M. Kyng (eds), Design at Work : Cooperative Design of Computer Systems. Hillsdale, N.J.: L. Erlbaum Associates.

[9] Gell, Alfred (1996) ‘Vogel’s Net: Traps as Artworks and Artworks as Traps’, Journal of Material Culture 1(1): 15–38.

[10] 2005. “Cosmogram.” John Tresch. Interview with Jean-Christophe Royoux, in Melik Ohanian and Jean Christophe Royoux, eds. Cosmograms. Lukas and Sternberg. New York. pp. 67-76.

[11] Ingold 2000, The perception of environment, essays on Livelihood, Dwelling and skill