

Updateable Material Products Factors

Objects of the subjects

Within the animal kingdom, human beings are one of the few animals that supports their activities by elements out of their body. Called objects to differentiate them from us, the subjects, we have been designing objects to capacity ourselves furthermore of our limitations. Therefore, understanding what they are and how they can contribute to our prosperity it is been a matter of high importance throughout history.

Object as process

That is why in the moment we find ourselves, in front of the biggest challenge ever faced by humanity, it is important that we reflect about the new scenarios that are emerging that question the definition of what we had understood as products, the industrialised objects. One of this new emerging scenarios is generated by the Functional Product Development and the Product Service Systems (PSS), an important contribution to create a sustainable society and therefore relevant for the curricula of our course (ESS). Based on positioning the function that an object delivers as the core of a company, the PSS are defined as '*tangible products and intangible services designed combined so that they jointly are capable of fulfilling specific customer needs*' (Tukker, Tischner, 2004).

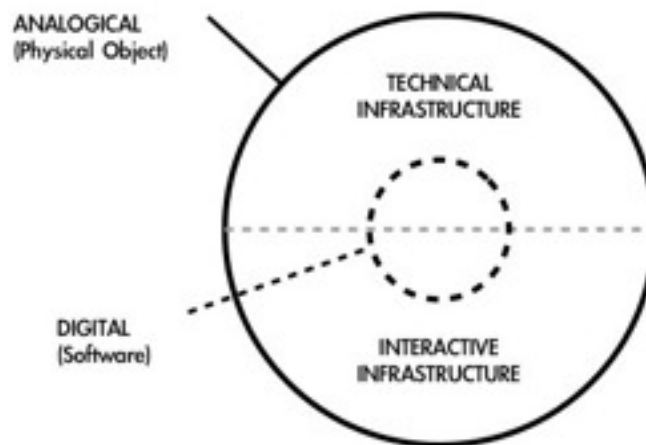
BUSINESS EQUATION	FACTOR	FACTOR	FACTOR	...	=	PRODUCT
Traditional	Technology	Time	Materials			Object
PSS	Technology	Time	Object			Function
	PROCESS					RESULT

From 'Object as Result and Product' to 'Object as Process and Factor'

This big shift in relation to the core motivation of a company displace the object, that up until now was the core for traditional business, and changes its nature. This is because in the business equation created by the PSS, the product, the finished result, is now the function that fulfills specific customer needs, and the object becomes just a factor for this product. The object then, now *is understood as a part of a process, as an organic an adaptable changing body that supports the delivery of the function.*

Object as Interactive Technic

From this understanding of the nature of this new context in which the object operates, is that we propose a new look of what it is an object. It would sounds familiar the eternal discussion between form and function around the object. The function, what we want from the object, we intuit that must be build by a technical infrastructure that makes it possible to have it. At the same time, we know that we need a form for this function in order to be able to engage with it and get what we want, and this must be build by some sort of an interactive infrastructure. Finally, during the last century, the revolution in informatics has created also digital functions and forms, giving us four ways to categorise the conceptual parts of an object. Despite the difference between each of this two or fours parts, depending if the object has or not software on it, it is not by any mean always well defined, represents just a useful mental model and give us a fresh lens to see the object.



Mental model of the Object as Interactive Technic

Asynchronous Innovation

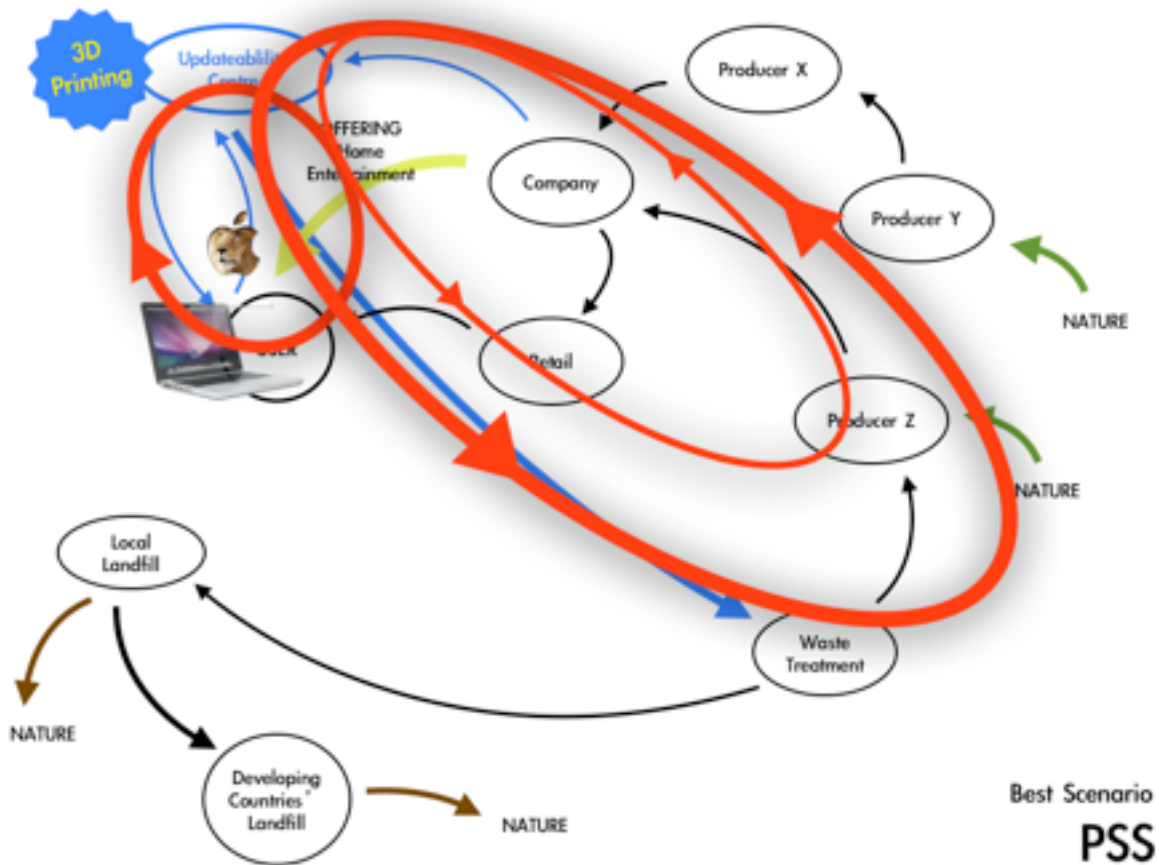
From the combination of the two previous concepts, **object as a process** and **object as analogical-digital interactive technic**, is that it appears the last idea. In the traditional business models, the object was a finished result and therefore any innovation of each of the parts of the object should be done at once. But understanding it as a process, there is now space to see the potential asynchrony between the innovation of each of the four conceptual parts of the objects. This is what we have call **asynchronous innovation**.



Example of a product with differentiate asynchronous innovation

Hypothetic case: Computer Laptop

From this conceptual exercise we question ourselves, how could be an object in this new scenario that offers a PSS with the three concepts presented in mind? We have tried to give an hypothetical answer by using the computer laptop as an example.



Our proposal for the hypothetical case with a laptop computer

Analysing the computer laptop through this proposed concepts we have seen that when placing it in a PSS and with the three concepts already mentioned in mind it has huge sustainable potential. We propose that in a PSS the computer laptop is offered as a material supporting the function of 'home entertainment'. The company then could start owning the object. A system is created where the laptop is seen as an adaptable platform. Therefore, based on current trends, we have seen that there is enough asynchronous innovation between the Analogical Interactive Infrastructure (AII) (the external parts that interact with the user) and the Analogical Technical Infrastructure (ATI) (the hardware) to propose a closed loop in the system that updates parts of the object before the system needs to change the whole object. This is done by a new stakeholder, that we have called Updateability Centre, which is in charge of receiving locally the computer laptop from the user and exchanging the parts that needs to be update, either because have been found obsolete or broken. Thanks to this middle step, a considerable amount of material is not replaced each time the customer enhance or extends its function-base relationship with the company, so there is potential to avoid "when old computers become obsolete or lack the required functional capabilities, they often end up in landfills or get shipped to third world countries, where the wastes can become a major environmental and health concern" (Carro, 2008). This create space for more closed loops adapted to the new needs that enhance the resilient use of materials.

This simple step can have huge impact on the design of the computer laptop itself. Because now the company could be interested in having a perfectly adapted to the user needs All, that enveloping the updatable ATI, will increase the control of the recycleability of its components and the optimisation of the materials. Furthermore by no replacing the All as often as the ATI it creates for the user a deeper emotional connection with the object because of the extended life of the same exact interface of the object. There is also the possibility to include the technology of 3D printing to adapt the production to local distribution and opens the door for cutting transportation and enhancing customisation of the objects.

Of course other challenges appear, as the difficulty of designing for the unknown future innovations or as most designer would claim, the potential to have disharmony in objects that are not being designed as a whole but a modular systems. It seems however, that is a challenge worth to take.

Olivier Mazimpaka and Adrià Garcia i Mateu
Engineering for a Sustainable Society, course of Msc Strategic Leadership towards Sustainability
Blekinge Institute of Technology
12/2011

References

Tukker, Arnold i Tischner, Ursula. 2004. *New Business for Old Europe*. Sustainable Product-Service System Co-design Network.

Carro C. 2008. *High Tech Trash: Will Your Discarded TV or Computer End Up in a Ditch in Ghana*. National Geographic. January 2008, p. 64-86.