Summary of AWT Background study 10

The art of innovation: the combination of soft and hard knowledge.

20 business people have their say

Ton Langendorff

Introduction

For business people, the 'soft' side of innovation is nothing new. They know from experience that technology alone is not enough to compete. It doesn't matter how technically perfect a product is, if there is something wrong with the design, if the price is too high, or if the product does not really serve any purpose, if a product is awkward to use or if it takes too long to deliver, or if the product is not supplied in enough versions in terms of colour or price, or if the product is still too new..., the customer will not buy it. If the price of the product is right, if it can be supplied quickly in all sorts of versions, if the brand and advertising appeal to the market, if the manual is clear and if the product is easy-to-use but if there are problems with quality, the customer will not buy it either. The 'hard' side of innovation cannot manage without the 'soft' side, and vice versa. This is true of the industrial sector which makes consumer products or semi-manufactured products and it is also true of the service sector in the consumer and business markets. We can no longer imagine doing without technology but as business gets increasingly to grips with the technology and consumers and business customers come to believe that the technology is normal, the human factor becomes more important. The technical perfection of Philips products was acknowledged by friend and foe, but many new consumer products failed because the engineers thought that perfection was enough. They thought the irrational, emotional wishes of clients were really nonsense. Consumers have their own ideas on that score. Machines and cars should just work. The decisive factor is often whether the product looks good, is appropriate for a lifestyle, and is tailored to individual requirements but for the price of a mass-produced product.

Innovation policy

None of this is new. Business people know it, and their customers do too. It is only in government policy that the emphasis is still very much on technology. Subsidies from the Ministry for Economic Affairs mainly target technological research, not design or marketing. The technology policy of Economic Affairs should really be known as innovation policy.
The Minister for Economic Affairs and the Minister of Education, Culture and Science, as well as the ministers of Agriculture, of Transport and Public Works, and of Defence, together with other 'hard' departments, know that the other 'soft' factors are also important. You don't deal with traffic congestion simply by building more roads. Numerous speeches have drawn attention to the importance of the humanities, social sciences and behavioural sciences. However, this is not adequately reflected in policy. Nevertheless, efforts are being made to push the boundaries of science and technology policy. The dissemination of knowledge to small and medium-sized businesses, the

application of existing knowledge, the formation of clusters of companies, professional education, lifelong learning, the importance of the 'soft sciences', the establishment of networks: these are just some of the buzzwords in use at the ministries. That is why the Minister for Economic Affairs and the Minister for Education, Culture and Science have asked the Advisory Council for Science and Technology Policy to determine the importance of 'soft' knowledge for sectors which were until recently dominated by 'hard' knowledge. This is the subject covered by the advisory report from the AWT which will be published at more or less the same time as this book[1]. This book does not contain any advice. It is simply a forum for people to talk about their experience and about what they want to see from the government. In addition, for the purposes of this book, we did not only approach companies with a typically technological profile in the sense that they are themselves developers of technology (Philips, Stork, Ten Cate, Curver). We also approached companies less dominated by technology (SHV, the Rotterdam Theatre, Albert Heijn, Berenschot).

Soft and hard knowledge, the arts/behavioural and social sciences and the exact sciences

Hard = technology, soft = people. That is, in crude terms, the distinction. They are simply umbrella terms which, it is hoped, mean something to people. But there are numerous nuances which can be introduced. There is a parallel distinction between knowledge from the arts and behavioural/social sciences - which are wrongly but, for the sake of simplicity, seen as a single entity - and exact scientific knowledge. These are also umbrella concepts. The parallel is problematic. Some forms of 'soft' knowledge - finance, negotiating skills, doing business in foreign cultures, human resource management, legal affairs, in short a range of fields belonging to the arts and behavioural/social sciences - are, in the business sector, as hard as they come. The list below may make things somewhat clearer:

soft knowledge		**hard knowledge**
design		research
marketing		invention
leadership		development
teamwork		patenting
advertising		quality
logo, brand name		standards
emotion, *fun*		the environment
service		rationality
colour, taste		objective
language		experimentation
image		metrology
organisation		proof
communications		verifiable
	finances	
	logistics	
	ergonomics	
	legal affairs	

The list can be extended with many more, overlapping keywords. It is slightly easier to list the subjects included in the arts, exact sciences and social/behavioural sciences. The triptych has a historical basis. Some arts disciplines such as linguistics or archaeology are, because of the exact methods they use, more at home in the domain of the exact sciences. And there are exact disciplines, such as mathematics, which some people think belong to the humanities. In addition, there are the marginal disciplines which are difficult to classify under the classic headings because they are multidisciplinary. Examples are the cognitive sciences, food technology or econometrics. The boundary between the arts and the social/behavioural sciences is also unclear. For example, where does law belong? Even within the parent disciplines, there are all sorts of branches -- studies -- such as liberal arts or leisure studies. Despite this, the list below represents an attempt at classification:

literature	mathematics	sociology
history	physics	economics
archeology	chemistry	anthropology
linguistics	biology	psychology
art history	medicine	educational science
foreign languages	pharmaceutics	public administration
lexicography	architecture	business studies
law	processing technology	politics
musicology	information technology	home economics
theatre studies	agriculture	ethnology

Two cultures, one economy

C.P. Snow, physicist and writer, once wrote an essay about the two cultures of the arts and the sciences. In his time, the distinction between three cultures, the arts, the sciences, and the third culture, the social/behavioural sciences, was not usual. Even now, the arts and the social/behavioural sciences are still thought to be related and opposed. This is an extremely crude classification. According to Snow, there was a mutual lack of understanding between the *two cultures*, the title of his work. And that would still appear to be the case. Condescending comments are made about *mechanics* and arts people boast that they are incapable of fixing a tyre or completing their tax returns. The scientists do not think that the social and behavioural sciences are science at all. They think they are 'soft', and many of them don't understand what they are all about.
I once listed these prejudices for a reading given by the president of the AWT, Harry Beckers[2]:

initial association	spiritual	material	social
is related to	wisdom	welfare	well-being
focuses on	culture	nature	society
method	search	research	finding out
approach	interpretation	measurement	counting
status	erudite	exact	woolly
results in	findings	inventions	find
public response	bafflement	amazement	I knew that already
collaboration	individual	partnership	schools
common features	patterns	laws	relations/correlations

If you think this is funny, you should certainly read this book. If you don't, you should read this book as well, because it will show you that you are right. Images of this kind are perhaps appealing but that is precisely why they are so deadly. Our society is saturated with technology and all its possibilities, but that society is also made up of people: clients, consumers, citizens and employees, with all their preferences, values and standards. A 'knowledge society' only merits that name if our ways of looking at people and technology play to the same tune. There will always be two cultures - art and culture versus technology and technique - but there is only one economy.

The art of innovation is the ability to combine

The word 'combination' was deliberately included in the title of this book. The people who have their say in this book do not claim that technology is unimportant and that the human factor is the sole determinant. Nor do they say the opposite. Dany Jacobs has recently been drawing attention to this point[3]. That is to his credit, even though, as emerges from this book, his message has been known for a long time to the business sector. But his terminology goes too far in the other direction. He recently wrote: "It won't be for the last time that I pick up a pen to point out that the critical core technology of the knowledge economy is the ability to heat air."[4] Perhaps it is because Dany and I come from different linguistic backgrounds, but the expression 'hot air' has negative undertones for me; people have more money than sense. But the explanation is clear. In the same newspaper article, Dany Jacobs also writes that: "New technology is admittedly the main engine behind numerous innovations. But, in itself, the application of new technological possibilities does not result in successful products. Products also have to look good, be produced efficiently and well, be easy-to-use and much more besides: they have to convey something, and establish an emotional bond with customers." That is clearly stated, but it has nothing to do with 'hot air'. For me, 'hot air' is too closely associated with swindles, nonsense, and functional redundancy. Sometimes, this is the case, as with Auping, which feels forced to add gimmicks to its technically perfect mattresses in order to improve its sales pitch. But the innovations made by Randstad are not different words for temporary work. The new Bouwflex provides added value which is indeed perceived as such by its customers. Is a tough Curver toolbox hot air? Is the Libertel regional rate? And the slim Campina Melkunie milk bottle? Is the new Albert Heijn supermarket formula hot air? Ola's Magnum is a robust ice cream. The same applies to Leolux furniture. Is the Wehkamp voice response system hot air? Of course not.
Now that policy makers and researchers are discovering that technology alone is not decisive but that other factors – both human and social – are of importance, we must be careful not to go to the other extreme. Technology is important, and people are too. What is important is to combine our understanding of things and people. We must not fall into the trap of thinking that one sort of knowledge just produces things that can fall on your toes and that the other sort of knowledge is stuck in mid-air. Soft knowledge is genuine knowledge which is just more difficult to grasp than hard knowledge.

Not representative but certainly varied

Of course, twenty stories do not provide a representative picture. Nor was this the objective. We did attempt to achieve diversity. A first glimpse at the twenty names may give the impression that we only approached the large companies. That is not the case. We also visited medium-sized companies (Leolux). And there are large companies, such as Ten Cate, which are in

effect collections of small and medium-sized companies. All twenty companies do indeed have international operations. But some are medium-sized and export-oriented (Auping) and others are subsidiaries of multinationals (Curver/DSM). A distinction was also made between typical 'manufacturing' industry (Wisa) and processing industry (Campina Melkunie). In addition to industry, the service sector is also represented (Rotterdam Theatre, Albert Heijn, Wehkamp). Then there are the companies which make consumer products (Ola) and the companies which operate in the business sector (Randstad). Philips has an intermediate position. The company is known for its consumer products but it also makes semi-manufactured products for the business market. There are companies which are highly capital-intensive (Libertel, Pakhoed) and companies which operate in a people business (Berenschot). The list of 20 companies even includes competitors (ABB Lummus Global and Stork Engineering & Contractors). The discussions were conducted with managers, but also with entrepreneurs/owners (KVL, SHV, Leolux). And, finally, the new information technology was also represented (CMG).
In short, the range was broad: large / small; export-driven / subsidiary of multinational; industrial sector (manufacturing/processing) / services; consumer market / business market; capital-intensive / *people business*; various sectors / competitors; new technology / *mature* products; and entrepreneurs-owners / managers.
And all that in twenty interviews.

Notes

[1] AWT Advisory report no. 29, “Interaction between the arts and science”. October 1997. Also available on the AWT Home Page http://www.awt.nl.

[2] Dr. Harry L. Beckers, "Bruggen bouwen tussen alfa, béta en gamma in de praktijk", *in:* H.J. Verkuyl et al., *Wetenschap en maatschappij;*, SMO, 1995, p.47.

[3] Dany Jacobs, *Het Kennisoffensief; slim concurreren in de kenniseconomie*, 1996.

[4] Dany Jacobs, "Lucht bakken", *NRC handelsblad,* 16-7-1997

Companies interviewed

Curver
Wehkamp
CMG Computer Management Group
Koninklijke Pakhoed
Albert Heijn
Leolux
Berenschot
Campina Melkunie
Koninklijke Ten Cate
WISA
Philips Research
Rotterdam Theatre
Libertel
ABB Lummus Global
Randstad
Ola
Stork Engineering & Contractors
Koninklijke Verenigde Leder
Auping
SHV