The Dynamics of Industrial Design
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Abstract:
As a country's economic and social structures transition from rural to industrialized to post-industrial, the nature of an industrial designer's job evolves. While many design schools have based their programs on an "ideal" definition of industrial design, many opportunities resulting from a careful analysis of industry demands and challenges are being missed.
It is the purpose of this paper to show how the industrial design profession could benefit from an uninhibited look at the new areas where the creative competence of designers is needed and how this could lead to an economic advantage for a country's industry.

Industrial Design going global

Having more or less recently celebrated my 60th birthday I begin to realize that this number also corresponds – at least roughly – to the age of the profession that I represent here: Industrial Design, at least in its modern definition, has existed in Europe for only a similar number of years.

Little over half this amount of years ago, my peers and I graduated from the first academic program in Germany that issued a university Diploma. In the early seventies of the past century Industrial Design was hot! In the course of a student excursion to the United States in 1973, we were amazed to see the size and the level of commercial design activity at the many corporate and independent industrial design studios that we visited.

Back in Germany, we all got jobs right out of design school. Big consumer electronics companies were hiring nearly any design graduate who could hold a pencil. AEG, the big maker of household appliances, maintained its own design office, and several of my peers joined its crew of more than 30 designers. Equally, Siemens, Krups, Rowenta, Braun, Rollei, Leica, Minox, and other German manufacturers of household and entertainment goods all had their own in-house design studios, and there was no shortage of employment for designers.

Throughout my many years of practicing and teaching design, I have come to realize that my profession has evolved dramatically. Not only do we use computers instead of drafting machines, but nearly all those companies that hired us in the seventies no longer exist.

Cameras, once proudly made in Germany, are created elsewhere. Household appliances are shipped here from China. Coffee makers, toasters, and TV-sets have become cheap OEM products made in Asia to which a sad single surviving designer in Germany is left to attach the "Krups", "Grundig", "AEG", "Rollei" or

"Rowenta" labels. Neither computers nor mobile phones are conceived or manufactured in Germany. The last remaining stronghold of design, Germany's automotive industry, finds itself threatened by inexpensive cars made in Romania, India, and soon enough, China.

It doesn't come as a surprise that the big design studios have long since disappeared from our country. They returned to Germany, however, in the form of subsidiaries controlled by foreign-owned anonymous manufacturing and investment companies. A case in point is Frog Design, which is owned by Flextronics which in turn is owned by Aricent which is controlled by the investment company of Kohlberg Kravis Roberts. This is globalization.

So what?

Design is no longer the material expression of a philosophy representing a specific culture. Instead, it has become an interchangeable, easy-to-replace global economic commodity that has led to a sterile, uniform, and mostly boring appearance of all the industrial goods that we have made to believe to be essential to our happiness. Few companies stem the tide, by keeping design a core asset – along with their non-compromising quality and technological leadership. All others confuse design with styling, quality with cost, performance with appearance, and design profoundness with the superficial copy of trends created by a market leader.

Sadly, design schools and universities around the world follow the trend.

Cultural identity

Thirty years ago, product origin was the prime criterion for a consumer's buying decision. "Made in Germany" stood for quality and longevity, "made in Japan" for technological innovation, miniaturization, and perfection. Today, my Grundig TV is from Turkey, and my presumedly German Liebherr refrigerator may well be made by Haier in China. Recently, I asked five companies carrying German product names about the origin of a specific product from their line. Four of them never responded, and one, Liebherr, told me that they wouldn't disclose this information. The German minister for consumer protection, Horst Seehofer, answered to my question about German product origin legislation that his ministry did not intend to make the disclosure of a product's origin mandatory.

The consumer's response is, consequently, to buy the cheapest product possible. Consequent in the sense that while labels and brand names are no longer representative of certain values – e.g. quality, longevity, or innovation – one might as well buy the cheap product. This puts more and more companies out of business. And it puts more and more people out of jobs.

During a recent visit to a leading Taiwanese manufacturing company, one of their engineers told me that he just had been given a choice: Either he followed his job to mainland China, or he *wouldn't* have a job. Incidentally, the same company released its formerly renowned design studio from the corporate context, following the example that Siemens Germany had set twelve years ago with its own corporate design department.

In the absence of any reliable information about a product's quality, consumers go for the bottom line: "If I cannot rely on a brand-name product to be of higher quality, I might as well buy the cheapest product. If it fails, I buy another one". This leads to the unfortunate situation that we experience now in Germany: Companies folding, high unemployment, taxes rising, wages stalling.

Companies themselves go for the bottom line too: "If I don't want to invest in quality and innovation, I might as well get my reputation on the cheap." This is exactly what happens with those design awards. But which educated consumer is fooled by a design-award sticker, while the product looks as outlandishly ugly as a certain, often-advertised brand-name "music system" whose cheap-looking plastic housing tells a story more powerful than any famous design award? Who would be fooled by an award issued by insiders to insiders? If anybody should issue a design award, it should be the consumer him or herself! In fact, design awards aren't necessary at all, because the market is the jury. And it doesn't charge a submission fee.

What is so wrong with the industrial design landscape? And why?

There are many things that are wrong with industrial design. First, there is no universal consensus on the definition of industrial design. Much less of what comprises *good* design. Second, anybody can call him or herself a designer. Third: There is no system for quality control. And there is no system for mandatory continued education. Fourth: There is no universally accepted platform for academic design discourse. Only the United States have a professional organization that actually works. Fifth: There is no system for industry to measure the success – or failure – of design, or to know how to pick the proper designer. Sixth: Designers never learn from their mistakes. There is no built-in feedback loop in the discipline. Seventh: There is no structured platform for discourse with relevant outside disciplines. It is professional organizations like the ACM that invites designers to participate. But few designers respond. Eighth: There is no universally accepted terminology, there is no development of relevant theories, there is no system for the quantification of economic gains over investment in design. Ninth: Designers ignore all or most of the science that influences design. And so on.

But most of all, there is a big problem with our own definition of design itself.

If we look at how design is published, exhibited, and judged in competitions, we notice one thing: Design is judged by nice pictures of models! Worse: a recent Taiwanes design competition requests entrants to submit *technical drawings*. It is hard to believe they will actually judge design by technical drawings!

Naturally, a picture gives a first impression and may well be instrumental early in our decision-making process. If the product looks ugly, I may not engage in further investigation. Good design, however, cannot be limited to the visual impression alone. If the sound a nice-looking product makes and its touch and feel are perceived as wrong, there will be a sensory discrepancy that in turn will keep a user from accepting the product. Likely, if the product – or any of its parts – move or behave in an unexpected way, the total impression is lacking harmony, and, again, the user may reject the product. Last not least, if the

interaction with the product is less than desirable, its rejection is a natural consequence!

Designers today consider themselves to be the experts of aesthetics. However, their concept of aesthetics is limited to the visual appearance of products. Their acoustic, tactile, gustatory, and olfactory appearances are left to chance, or to other experts in the product development process who may not share our sensitivity for aesthetics. Look at the stores and try any of the coffee makers, toasters, or any other consumer appliance available today: apart from their (questionably) good looks there is a concert of cheap metal, wobbly plastics, and unintuitive interfaces that manufacturers have to explain by means of cheap, ugly, printed user manuals that nobody ever reads!

So where are the designers?

Just like we interact with other humans and pets, or even with inanimate things, information is transmitted from the product to the user and vice versa. Possessing five senses that we know of, bi-directional information is also transmitted across five channels of information. And: Information is exchanged during various phases of our interaction with a product.

	Channel	Type	Examples
	Transmitter	active	Light bulb, LED, display, moving elements
Visual		passive	Form, proportion, color, texture, radii, gloss
	Receiver	active	Bar code scanner, camera, autofocus device, OCR
		passive	Photo cell, infrared motion detector, night-vision device
Acoustic	Transmitter	active	Loudspeaker, siren, horn
		passive	room acoustics, echo
	Receiver	active	Depth sounder, ultrasonic distance measuring device
		passive	Microphone
Tactile	Transmitter	active	Heater, vibration alert
		passive	Texture, form, temperature conductivity; Braille device
	Receiver	active	Ophthalmic eye pressure monitor (air pulse type)
		passive	Blood pressure monitor, push button, switch
Olfactory	Transmitter	active	Material-specific smells (wood, leather, plastics)
		passive	'Scratch 'n Sniff' pad
	Receiver	active	Gas spectrometer
		passive	Smoke detector, breathalizer
Gustatory	Transmitter	active	Taste substance given off continually
		passive	Taste substance released upon contact with saliva
	Receiver	active	Imaginary robot mosquito (yet to be developed)
		passive	Litmus paper; enzyme-based blood glucose analyzer

Table 1:   Information transmitted and received by a product (active and passive modes)*

These are twenty opportunities for good design, nineteen of which we ignore on a regular base.

One has to consider another fact. Our interaction with a product happens throughout various phases:

Phase 1 – First contact: We see an object and decide whether it interests us or not in our current context

Phase 2 – Analysis: We try to understand whether the product is suitable for the intended purpose. We look at the product more closely, try to figure out how it works, and try to make up our minds about the value it might represent for us

Phase 3 – Use: Information we exchange with the product throughout our interaction (Please make me a cup of coffee – the coffee is finished).

Phase 4 – Post-use: Information we exchange with a product after releasing it from use (Is the electric iron still hot? Is the battery charging?)

Five senses, two directions, active and passive modes, four phases – this now makes for a total of *eighty* singular opportunities for design. Only one of these is typically considered the domain of industrial design.

Designers attending just the visual transmitter of a product ignore 98% of the opportunities to leave a sustained positive impression with the user. No wonder so many products fail in the market. This is why there is something so terribly wrong with the design profession today.

This far we have not looked into the behavior of products. Products *change* over time. They change in macro and micro time. On the macro scale, products age and most of them wear and become ugly. Only in the Japanese concept of wabi-sabi we find a philosophy that questions the aesthetic deterioration of products over time. Sabi makes us aware of the possibility of product aging in a positive way. In the southern German state of Bavaria, *Lederhosen*, a traditional type of leather pants, gain value as they begin to show signs of wear. Apparently, sabi is known also in cultures outside Japan. However in the design disciplines it does not seem to play a role (with an exception: fashion design).

Products also change on the micro scale of time. The way a toaster ejects a slice of bread can be a pleasant aesthetic experience, or we may perceive it as unpleasant. There is a big difference between products that behave like Frankenstein and those that rival the movement of a ballerina.

When looking at the question at the top of this chapter, we wonder how it is possible that designers leave such a big area of their native territory – that of aesthetics – uncharted and unexplored. Any decent university design program should instantly introduce subject matters and projects to sensitize their students

to issues related to multisensory interaction, product dynamics, and product behavior.

Two Economies

As we design our mobile phones, cars, and other things that we consider essential, we – the people of the technologically advanced part of the world – tend to ignore an important fact: We are but a slim, fortunate minority!

Approximately 5 billion humans on this planet have other worries than shopping and entertainment. Their question is, how to provide food and water and a space for their family. Or simply: how to stay alive in the presence of crazy men fooling around with weapons sold to them for profit by nations such as ours.

Thousands and thousands of men, women, and children are trying each year to escape from their poverty-stricken, war-ridden countries to a place where they can live in peace and decency. Hundreds of them lose their lives drowning in the Mediterranean or Atlantic Oceans, or they are killed or arrested by border guards employed to protecting the territorial integrity of their country. Women and children are sold for prostitution. Poverty and misery are everywhere. How can we close our eyes and pretend this doesn't exist?

Even if we manage to ignore the imbalance of wealth now, we will not be able to do so forever. The flood of economic refugees will become a tide and grow into a tsunami; eventually they will take by force that which we, the lucky ones, are so eager to protect.

If we wish to keep our wealthy and protected lives, we have *one* chance. Our chance is to invest some of our wealth now helping the less fortunate to generate their own economic base. This is called development cooperation. Until recently, development cooperation helped to build water wells and to reforest deserts. Today, the modern form of development cooperation brings partners from the wealthy and the less wealthy countries together, joining forces in the effort of bringing economic and social perspectives to those who never had them.

If we, the designers, pride ourselves for being creative and innovative, why don't we put our creativity and innovativeness to work in development cooperation? In fact, this is what some designers are already doing today.

Germany's biggest NGO, *Gesellschaft für Technische Zusammenarbeit* (GTZ), financed the Design Technology Center in Dhaka, the capital of Bangladesh. *Designer without Borders*, a Norwegian NGO, sends designers to Guatemala, to work with indigenous communities and with the city government of their capital. I am also glad to report that the *Taiwan International Cooperation and Development Fund* (ICDF) supports projects in Guatemala. I am particularly proud of the fact that we at our design school in Berlin have been able to help our Taiwanese exchange student Hsu Yu-Tzu to spend a semester working with our partner organization INDIS in Guatemala assisting a group of indigenous women in their development of a new line of products.

Outlook

It is apparent that at both ends of the spectrum of design competence there is a vast potential for the development of new design opportunities, in the fields of extreme high-tech and extreme low-tech. Plenty of problems exist that would benefit form the creativity and innovativeness of the industrial designer.

In the future, designers will not limit their cooperation to either high-tech companies at home or the economically deprived regions abroad. In our travels around the globe my students and I have witnessed so much beauty and competence in the regional crafts. We have seen so many traditions and examples of cultural identity that could provide us with an escape from the utmost aesthetic boredom and total lack of truly fresh ideas that characterize this discipline today.

Modern communication and information technologies will facilitate the development of new synergetic networks. Why not combine the best of both worlds, high-tech electronics and low-tech crafts, to generate a new type of products that make the best out of our ability to mass-produce, and theirs, to create beautiful, individualized objects. Why not develop a mobile phone, for example, of which the electronic innards are produced here with the shell manufactured in Bangladesh from plant fibers and natural resins? Why not think of planting trees of which to harvest the resins and therefore reforesting some of the deserted areas that already create so many ecological problems in the world? Why not invite the creative, native designers around the globe, to participate in our economic activities so they can share some of our wealth and comfortable living conditions?

There is plenty to do for industrial designers. We only need to begin to think.

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*See also <http://hginnow.de/Texte/Beyond%20Cosmetics.pdf>