

Advancing Rail Design

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You are standing on a German railroad platform, say at Berlin Zoo Station. A beautifully designed ICE 3 high speed luxury train approaches, slows down, hisses to a stop.

You admire the sleek front design, the smooth exterior, the way the doors swing open.

What a marvelous job those designers have done!

You have been standing on this platform for quite a while. The train is late. You were unaware of any delays until a tiny display above flipped its "approx. 20 min. late" message at you and the other passengers around you.

Well, you say, there goes that connection I was gonna make at Hannover.

Speaking of the other passengers: there are quite many of them. In fact, there are so many of them, along with all their friends and relatives that you can hardly find a place on the floor where to rest your heavy briefcase. Which is O.K. to some degree, because you're not even sure where you would set it down even if you could: It's hard to say to which ground surface peculiarity you would prefer to entrust the clean bottom of your briefcase: Is old chewing gum safer than the sticky dried-up puddle of Coke? Choose the cigarette butt over the speck of spit? Or do you prefer the anonymity of that uniform layer of gray universal dust?

Think positive. The crowds around you keep some of that cold wind away and prevent you from freezing to death. Because the temperatures inside your railroad station happen to be identical to those on the outside. But the fresh winds also keep some of the smells away from you which is good because it gives you at least minor relief from the omnipresent stench of cigarette smoke typical of the airports, shopping malls, restaurants and railroad stations in Germany.

Eventually you make it into your seat, and the train takes off. You relax and ponder questions such as: why do passengers who didn't get a seat reservation have to pay the full fare? Why are they blocking the aisles preventing me from reaching the restaurant? Why is it that I could have taken the airplane for less than the fare of this train ride, getting me from Berlin to Stuttgart in one hour instead of six? Why is it that the Seoul, Korea, railroad station is comfortable, smoke-free and heated, with just a thirty-second exposure to the environments at boarding time? Why is it that at an American Amtrak station you check in your luggage at the counter and get to relax in a clean, smoke-free and air conditioned waiting room? Why is it that railroad service design and comfort even today are based on the technological standards of the steam-engine era?

What I'm trying to point out by these observations – and I could easily go on describing similar deficits with respect to the *interior* of my luxury train – is what I consider a major

discrepancy between the design of the railroad running hardware and the design of the total railroad experience.

From the user point of view railroad designers are doing a wonderful job, as far as their attention to the visual appearance of the hardware is concerned. Still, their customers stay away, using railroad service only when everything else fails.

At the 1997 Minneapolis Conference on Design in the Digital Environment, Michael Schrage, a business journalist and former MIT researcher coined the term of *Provinces* and *Serducts*. According to Michael Schrage, the former distinction between manufacturers of products and providers of services has vanished. Companies who choose to ignore this fact will soon be ignored by their customers.

Telephone companies and car manufacturers have been aware of this fact for a long time. Others are following. A German TV manufacturer offers its own service channel, providing automatic software updates for TV sets and information via the internet. One of their German competitors who still hasn't got the idea is barely hanging on, but for how much longer?

In rail passenger service designers are trying to cure a disease that isn't. When my toaster burns the bread, shoots it at the ceiling, clanging and rattling away and sounding like a bag-full of metal scraps the designer's most enthusiastic attention to perfect form and shape will not furnish the hoped-for result. Even worse: its beautiful visual appearance will only magnify the user's perception of its inferior service.

In cars, airplanes and computers 100% reliability is expected. Should a problem occur, complete and honest information as well as fast and courteous help are the only remedies.

Rail service in Germany insults its customers with a random rate of reliability and punctuality.

Tolerating trash, dirt and grime in the railroad environment is an open invitation to vandalism. A single cigarette butt on the floor that isn't cleaned up instantly is like telling everyone, hey, drop your trash wherever you wish. We don't care. Anything goes. Don't worry, we won't persecute you. Soon enough more trash, graffiti and vandalism will follow. I am convinced that this chain of events is already set in motion by the mere presence and tolerance of cigarette smoke in the public environment.

In a vandalism experiment a researcher parked an older car in a residential neighborhood. Nothing happened to the vehicle until a number of days later when the researcher purposely smashed one of the smaller side windows. Within days all the windows were broken, everything removable was gone, the vehicle turned into a pile of scrap. The researcher's act set an unmistakable sign that private ownership of the car had been given up and the vehicle was now free to be claimed by anybody. The German railroad environment often enough transmits the same signal: that of abandonment and absence of ownership.

My list of complaints is much longer, but I will stop here, because I think these examples are sufficient to illustrate my point.

Designers worldwide are expanding their responsibilities into new fields beyond visual aesthetics. Designers have realized a need for interdisciplinary cooperation with specialists from fields like Experimental Psychology, Cultural Anthropology, Cognition and Communication Sciences, Psychoacoustics and Evolutionary Psychology. The basic infrastructure necessary for original design research exists in the many postgraduate programs in England, Sweden, Finland, the United States, Korea and Taiwan, to name a few. Design education in Germany ends at the diploma level, effectively limiting the possibilities of design research in this country. At the October 1998 Doctoral Education in Design Conference in Columbus, Ohio, designers from several countries struggled for a new structure of design research at an even deeper level of involvement beyond the average master program. With this program in place, we will at last be able to more than scratch the surface of all those new and exciting opportunities design is facing today and in the near future.

Talking about opportunities. Let me get back to some of the problems I mentioned earlier which I now will address in terms of design opportunities.

Cost, safety and the plain job of transporting me from one point to another along with punctuality and reliability all combined form my perception of value. Being able to choose from alternate means of transportation, the issue of *value* becomes relevant as a base for my decision.

Rail service usually is only one but a crucial link in a complex chain of activities, for example in my participation in this symposium. Transportation needs to be calculable, or its value decreases.

Can designers design punctuality? Maybe not, but they can change the way humans *perceive* time. You may have read the story where passengers at an airport complained about the time they had to wait for their luggage to emerge at the baggage claim. In order to keep the walking distance short, airport architects had taken great care to locate the baggage claim right by the gate. Unable to speed up the unloading of the luggage any further, airport management cleverly responded by directing the passengers to a remote baggage area. Now they have to walk longer and arrive simultaneously with their luggage. The complaints have subsided. The time delays are the same. What changed was the passengers' perception of the delay.

Also related to the perception of time is the disharmonious flow of time.

Due to a delay I make a dash for a connecting train, collapse in my seat, only to find out that this train's departure has been delayed too. I could have walked leisurely, bought a magazine and have a coffee. Instead I'm exhausted and angry.

Phases of haste and hurry alternate with boredom. Proper information design could alleviate the stress and help to restore customer satisfaction.

Our discussion of the objective, the measurable, and the subjective, the perceived, aspects of time gets us right into another topic. The term *value* assesses the objective qualities of a product or service. An English term for the German word "Wertigkeit", meaning the intangible qualities of design, has yet to be coined by someone more qualified than myself. "Wertigkeit" relates to the immeasurable, subjective qualities of a product or service. Wertigkeit is the sum total of the concepts found in the words Quality, elegance, smoothness or in what we may call the emotional qualities in design.

An attempt to define Wertigkeit had been undertaken by the Japanese several years ago. They called it miryokuteki hinshitsu, which basically means extraordinary design, or tokimeki design, meaning getting your hart to beat faster, or Kansei Engineering. Not much has happened since, but I am very certain that provided we get a grip on value, Wertigkeit will be the next big challenge.

Wertigkeit with respect to rail design opens up a whole new field of opportunity. Waiting in cold weather, breathing smoke-polluted air, standing on a grimy platform are just the opposite of Wertigkeit. In my lecture at Braun Corporation I defined Wertigkeit as those qualities in a product or service that satisfy the patterns of behavior established in humans by their evolutionary history. According to scientists working in the field of Evolutionary Psychology, most of our behavior including aesthetic preference can be explained by the behavioral patterns resulting from our adaptation to the natural environment throughout those three or four million years of human evolution.

Visual aesthetics is a part of Wertigkeit, but the concept does not stop there. Humans are equipped with 5 senses, and they have learned to rely on all of them in order to navigate in the real world. In fact, even our five senses provide only sample data of the entire universe surrounding us. From these sample data we construct our mental model of the world. The human mind constantly monitors input from all five of our sensory channels and interprets all the input comparing it to any insight and experience acquired previously. Designers focusing solely on the visual messages of a product will inevitably invite conflict in the user's interpretation of a product, system or service. A great-looking toaster telling an acoustic story of the cheapo mechanics inside will only prove the designer's guilt in the big visual cover-up of the discrepancy between the true and the perceived values of the product.

Train environments that smell bad, sound bad and feel bad to the touch will just counteract any attempts of the designer to establish aesthetic value in the visual output of the product.

Given the limited time here I will jump to additional consequences for rail design as they relate to the issue of Wertigkeit.

When designing the latest high-speed trains designers automatically assume there is a railroad platform from which travelers will watch the train as it enters the station.

In their homes and cars, in airport lounges and shopping malls and other public spaces people have come to expect good ventilation and a climate control system. If rail

designers are truly interested in a higher level of customer satisfaction, they will need to find a way to insulate the railroad waiting areas from the environment. This is entirely possible as demonstrated by the example of the Seoul, Korea, main railroad station, even still with conventionally designed trains.

Rail-bound public passenger transportation is correspondingly provided by people movers like the one at the Las Vegas airport, or – vertically – by elevators. In both instances, customers do enjoy the comfort of an air-conditioned environment. While waiting for the people mover or elevator to arrive, they are basically looking at a closed door and – in case of the elevator – at a display informing them about the current location of the car. This solution demonstrates how waiting time can be dealt with. It also shows how the product's visual aesthetics recedes into the background in favor of extra comfort and service. In case of the people mover one still *does* have the opportunity to watch the vehicle approach if one so desires. Few people care. In case of the elevator, the cabin's exterior design is not even visible from the waiting area.

To redesign all the railroad stations within an existing system will be a difficult task, but the least one might try to attempt is to install high-end enclosed environments initially for the business traveler. Once a certain door pitch can be standardized across the system, enclosed environments become entirely feasible for every type of train. I consider this a high priority in rail design. Of course there needs to be an integrative approach to rail design. No longer can we afford to split the tasks of designing the running gear and the stationary infrastructure between separate organizational entities. Rail design needs do be dealt with on the system level and from the user's point of view.

Rail design needs to participate in an effort to serve and pamper the traveler at all stages. We need to point out to the decision makers that travelers come in many forms, shapes and fashions. Rail design needs to take into account that there are many forms of handicap. A foreign visitor is just as handicapped in this country as a German national with a reading disability. A traveler carrying two suitcases and a small child is the equivalent of a physically disabled person. Designers need to make rail transportation universally accessible, including for children, the aged and the foreign visitor. Visual and acoustic information need to be presented in an internationally acceptable form.

Service design, time management design, multisensory design, transcultural design and design for "Wertigkeit" are just a few of the many tasks rail designers have to accept as their responsibilities.

At Kunsthochschule Berlin Weissensee we're not any smarter than you, but we're prepared for and interested in the exploration of these new areas in design. We are frequently working in interdisciplinary teams and with outside partners, and we are always looking beyond the obvious. Personally I'm not interested in a redesign of a train's exterior or interior as long as the problems are rooted elsewhere. But I would go nuts about an opportunity to cooperate with industry and other educational partners on any of the issues mentioned above.

In past industry-sponsored projects we have been looking into interface issues as they relate to people's interaction with complex digital products.

We worked with bus manufacturers and operators on issues related to vandalism.

We have worked with an elevator manufacturer in Finland on the psychological problems related to elevator design.

We am conducting cooperative projects with universities in Korea, Taiwan, and Hong Kong in order to explore some of the cross-cultural issues in design.

Based on a project's characteristics and outside support we assemble student teams of industrial designers, communication designers, architects and other disciplines developing design solutions well beyond the conventional.

We will continue to look for interesting challenges and motivated partners to bring about innovation, to keep an edge over our competitors, to give our students a good start into their careers and to serve society with designers who are prepared to tackle the problems of the future.

As a design school we cannot operate like a design firm as far as predictable outcome and scheduling are concerned. Our strength is to develop reality-based advanced concepts for a vision horizon beyond the next trade show, typically looking at a three-to-four-year range.

I appreciate the opportunity to present my ideas at this symposium, and it is my hope to return home with a bundle of new contacts and leads for interesting future projects.

Thank you for your attention!