

An Ode to TomTom

Sweet Spots and Baroque Phases of Interactive Technology Lifecycles

Jan Borchers • Feb 12, 2008 • borchers@cs.rwth-aachen.de

A few months ago, my sweetheart said one of those things that'd make every geek start drooling: "I hate getting lost each time I drive into Cologne. Can't we get a TomTom?" I love getting a free ticket to spend obscene amounts of cash on a gadget, without all the weak, post-hoc rationalizing why it's so useful, usually met with something between fury and pity, depending on its price tag, size, number of cables, and overall potential for destroying your living room's visual appearance. But I digress.



For those of you living under a gadget-proof rock for the last few years, a TomTom (mine is a GO 910) is a GPS car navigation system made by the current market leader of the same name. You stick it to your windshield with a suction cup, tap in your destination address, and off you go, hopefully in the right direction.

It has also become the technology to most profoundly influence my everyday life since my first DSL flat rate in 2001. And that's although I'm not a regular driver — or maybe just because of that.

Now, I will admit that I got my first mapping software fix back in '97, when a little-known Dutch software company called Palmtop had just released *EnRoute*, a route planning application for my favorite personal computing device of all times, the Psion Series 5mx PDA.

But back then, of course, there was no live navigation support. GPS



devices were still something supremely geeky, and well beyond the purchasing power of your ordinary computer science grad student (i.e., me). Geocaching had not even been invented.

Also, honestly, only geeks had PDAs back then, so this was definitely not affecting the public at large yet. But we, the bold and fearless early adopters could explore this strangely empowering new world of geographical information at our literal fingertips. While I hardly used it for the demanding task of live in-car navigation, it became indispensable to quickly estimate driving times when planning trips, or to simply cover my supreme geographical ignorance in a conversation on, say, the wonderful architecture of Barcelona, by discreetly checking which country that was in again.

While it did become possible later to attach a GPS to your PDA (until you realized that multiple loose devices, power adapters and 200 feet of cable around your dashboard weren't exactly boosting safety, and that setup took longer than most actual trips), it wasn't until around 2004, when Palmtop—now renamed TomTom!—and others started selling all-in-one devices, that live navigation support became a realistic option for the average consumer.

Boy, what a difference. Instead of having to map out each new trip in advance, write down or print out instructions that as soon as you hit the road you found you'd conveniently left on the kitchen table,

having your co-driver call your friend for instructions on a bad cell phone connection instead, which he'd then repeat back to you while you're nervously peeking at each new cross street sign because it *could* just be the one where you had to make a right (or was it left?) — in short, instead of this constant sense of sublime (or not so sublime, depending on the nature of your fellow passengers) tension while driving, you could now focus on traffic and your environment, knowing your TomTom would let you know about each turn in time. Even male drivers have been reported to occasionally have a few brain cycles left now to follow what everybody else in the car is chatting about. In other words, here's a complete revolution of your emotional experience of driving somewhere when you don't know the route well.

Its real potential unfolded for me, though, when we moved to San Diego recently. It's hard to imagine the stress this saves you driving around an unknown city in a different country. It also quickly becomes hard to remember how much of a hassle it all was before. In fact, TomTom offers special computer voices with "I *told* you we should have taken that exit"-style instructions, should you miss that part of the classic driving experience.

Of course there are still plenty of usability problems that make you scratch your head, wondering just what they were thinking. City or street names are listed so close below each other that you keep selecting wrong ones — Fitts' law at work. I also got a furious call when my sweetheart first tried using it: Köln (Cologne) wasn't in the city list. It turned out TomTom had left out German umlauts on their onscreen

keyboards, but forgot to include the standard transcriptions in their search algorithms; unable to type *Köln*, she'd entered *Koeln*, but the system was expecting *Koln*, not even listing the city as a close match otherwise. Dudes, localization.

Oh, and turning it on is a nightmare. Pressing the tiny, half-sunken power button briefly is happily ignored, but keep pressing it a couple times at the wrong moment, and it won't turn on at all anymore. Protecting against inadvertent operation is fine, but have these people ever heard of the inherent evil of time-based interactions, or of at least providing appropriate feedback when they're unavoidable? A short "thank you, starting up, you can let go now" beep would have done the trick. But then again, no one with the slightest case of arthritis in their fingers will ever be able to press that button, so with our aging population they'll soon run out of customers anyway.

But I'm sure these issues will be fixed. My point is that TomTom has crossed—no, jumped across—the *threshold of indignation*, as Paul Saffo put it in Terry Winograd's great book, *Bringing Design To Software*: The usefulness of their devices by far outweighs the remaining awkwardness in their use for a wide range of users and their daily tasks.

Obviously, the entire user experience counts here. You can *actually* go and buy this thing in a department store today, stick it to your windscreen, turn it on, and after making a few obvious(!) choices, enter your first destination and be on your way. This is careful design. Some companies, like TomTom and Apple, get how important this *first-encounter usability* is, from just the right software default settings, to physical device design, to the printed quickstart, to the

design of the packaging. It's no coincidence that, for a brief, innocent period, googling "iPhone porn" actually led to slideshows of devoted users unpacking their new gadget.

So what can we learn from the TomTom story? At some point, the mix of features, technical feasibility, and task-centered product, software and user interface design came together to shape a product that could make such a radical difference to people's lives that its popularity skyrocketed. Of course this takes years of market research and iterative product development, but it creates a qualitatively new product genre that brings an unprecedented and realistic promise to the market and fulfills it. I call this moment the *sweet spot* phase.

A telltale sign that a product has reached this stage is that people "get" its usefulness within fifteen seconds of explaining, even though they may not know the technology yet (or even understand it afterwards). Non-geeks start telling *you* about this new thing, and begin to evangelize others about it.

Another sweet-spot indicator is that social behavior around the associated tasks changes. These days, when someone gives me driving directions — a sales clerk on the phone, or a friend inviting me to his house —, I find myself politely cutting them short, just asking them for their street address to write down and type into my TomTom.

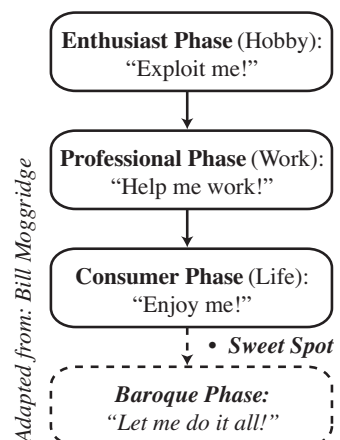
Clearly, using these devices also has questionable consequences. For one, we quickly begin to rely on them. Usually, after going to a new destination with my TomTom, I still couldn't go there on my own: there was no need to memorize the route. A more subtle effect is the potential loss of a mental area map — with a

TomTom, you never care to develop a picture of your city as a whole in your head. Will people forget how to describe the way to their home to others? Will real-estate owners bribe TomTom to direct traffic away from their upscale properties? Studying these effects will keep us busy for some time. But even such potentially adverse consequences show the fundamental change a technology has brought about.

Now the bad news: feature development doesn't stop at its sweet spot. Beyond the idea of providing reliable, easy-to-use directions, TomTom has since added an MP3 player, live updates through the wireless network, connections to "Buddies" (the use of which has escaped me so far), cooperative street updates, photo slide shows (I'm not kidding), and a stream of other features. Some of these are actually useful, but the original TomTom was the sweet spot.

David Liddle, design lead for the world's first commercially available GUI computer, explains his theory of technology adoption in Bill Moggridge's wonderful book, *Designing Interfaces*. He postulates a first, enthusiast phase exploiting the new technology, a second, professional phase putting it to use to get work done, and a third, consumer phase when it becomes available enough for people to enjoy.

I think we should add a fourth stage to this otherwise excellent model: the *baroque phase*, in which the successful new consumer product genre is then embellished with secondary features that often already existed before but are now integrated into the new product.



This phase obeys the terrible law of feature creep. Consumers, having experienced the wonderful new possibilities of the initial “sweet-spot device”, are hoping that subsequent products in this new genre will have equally revolutionary, additional positive impact on their everyday lives—which of course they don’t, as they’re just incremental improvements—, and so buy new models because of their added features. The resulting featuritis, prevalent in software, is spreading to consumer devices

as they are increasingly software-controlled. (Shopping for a new toaster, I recently encountered a model that would assist me in my complex toasting tasks with an informational LCD screen. Please?)



Photo: KRUPS

At first sight, sweet spot and baroque phase seem hard to tell apart: Both give the user new features, just at different levels of originality. But there’s an easy test: Sweet-spot products make your life *simpler*, baroque ones *more complex*. Sweet-spot products support you in a new way, making a previously difficult or awkward task change fundamentally. Learn just a few new things, and you get an almost magical boost in productivity, simplifying your everyday life. Baroque products just tweak existing processes, trying to make them more efficient in some situations, but often complicating other tasks (and sometimes the most frequent ones — think microwave ovens). And to use them, you often need to learn a fair amount of new interaction concepts, operations, and other lingo.

Let’s look at some products I consider worthy of a sweet-spot award, and some technologies way in their baroque phase.

Cell phones hit their sweet spot in the

mid-90’s: pocketable handsets, with several days of standby and calling charges that didn’t ruin the average consumer anymore. What a change! Within years, people moved from carefully planning their evening out to “call us when you’re ready, we’ll tell you what bar we ended up in”. Agreeing when and where to meet, which often failed before, leading to heated arguments whose fault it was (“but I was looking for *you!*”), was replaced by the stress-free model of just calling if something came up, no matter where everybody was. The list goes on.

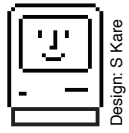
Today, cell phones have moved squarely into their baroque stage. In a 2007 study we did for German’s largest mobile technology consumer magazine, *connect*, virtually all models we tested gave users problems with even the most basic and essential tasks: turn on, mute ringer, call number. Being able to browse the web, take pictures, watch or record movies wherever you are is great, mind you, but it has overloaded the sweet-spot product and interaction design of the traditional mobile phone beyond recovery.

The only way out was to radically rethink the product. Apple’s iPhone did that to a degree, removing the keyboard and its dead-end soft-key concept, and introducing multi-touch to more directly interact with what’s on screen. It was far from perfect, but mobile browsing became good enough to become *useful*, giving you the tingling feeling of a new sweet-spot candidate.

Or take home internet access. After listening to our chirping modems for years, it was the DSL unlimited-time, unlimited-volume flat rate that changed how we thought about the internet: Suddenly it was *free* to access the net after paying a fixed monthly fee. Getting



Courtesy Apple



Design: S. Kare

movie showtimes, driving instructions, or just a recipe for cranberry sauce became a snap. And flat rates made our systems be always-on, with no dial-in delays. Since then, providers have tried to integrate DSL, landline, cable, and cellphone contracts, leading to a maze of options with some further savings but no impact anywhere near that flat rate DSL effect.

Occasionally, consumers will go as far as backpedaling to get back to the sweet spot.

My last microwaves were all of the one-dial-for-time, one-dial-for-power, go-bing-at-the-end variety, and I can't be alone, judging from what's in stores. On

my Sony-Ericsson T630 phone, I quickly replaced the default, distracting, low-contrast ColorBombs theme with a simple black & white one that let me focus on the important stuff.

The desktop metaphor had its sweet spot with the release of the Xerox Star and Apple Macintosh between 1981 and 1984. Since then, its basic idea has remained unchanged, as is often lamented, and only small improvements and secondary features have made it onto our screens. Smaller sweet spots were reached within that metaphor (full-text search or Apple's *Time Machine* backup come to mind), but most new, more colorful and feature-rich systems fall into the baroque phase. Sometimes I fantasize about a system that returns the

desktop metaphor to its sweet spot (not that that would be very useful today), or that finds the right revolutionary approach to kick the desktop metaphor out the door.

Other examples include the original iPod, or the affordable digital consumer camera with enough resolution for standard-sized prints, letting you take, immediately check, and delete shots for free. TiVos changed TV viewing habits fundamentally, and personally I would include iChat AV, for letting me show our new kitchen to my mom some years ago, walking around with a laptop and iSight camera (ok, still geeky).

So what gives? For consumer experiences, HCI research should focus more on preparing, and industry on creating, new sweet-spot devices, rather than wasting time on baroque extensions of existing paradigms. To make history, look for that sweet spot providing the broad public with a device/application/service that they had no usable, affordable access to before.

This, by the way, is also why HCI is key to innovative products. Sweet-spot solutions are task-centered in an unprecedented way, they are uncluttered, simple, and elegant.

The other day, after googling another nearby store on my iPhone because the one we were at didn't have what we wanted, my sweetheart said, "you know, it's really incredible how useful this iPhone is." Now excuse me while I go and drool some more.

Jan Borchers is a professor of computer science at RWTH Aachen University in Germany where he heads the Media Computing Group, studying interaction with audio and video streams, mobile devices, and ubicomp environments. He's currently deserted his students for a sabbatical at UCSD to write random rants like this. He's not getting paid for this article by TomTom, Apple, or Psion, although he will happily provide them with his banking details should they feel obliged otherwise. He can be found at <http://hci.rwth-aachen.de>.



Photo: T. Karrer

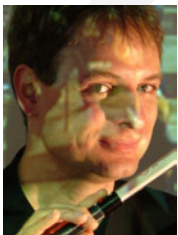


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