Mossberg: The Disappearing Computer and Ambient Computing

Tech was once always in your way. Soon, it will be almost invisible.

by Walt Mossberg@waltmossberg May 25, 2017, 10:00am EDT

*Welcome to Mossberg, a weekly commentary and reviews column on The Verge and **Recode** by veteran tech journalist Walt Mossberg, executive editor at The Verge and editor at large of **Recode**.*

Now, as I prepare to retire at the end of that very long and world-changing stretch, it seems appropriate to ponder the sweep of consumer technology in that period, and what we can expect next.

The big software revolutions, like cloud computing, search engines and social networks, are also still growing and improving, but have become largely established.

Consumer drones and robotics are in their infancy, a niche, with too few practical uses as yet.

The biggest hardware and software arrival since the iPad in 2010 has been Amazon's Echo voice-controlled intelligent speaker, powered by its Alexa software assistant. It arrived in 2015, and was followed last year by the similar Google Home device. I expect others.

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But the Echo and Alexa are just getting started. Amazon CEO Jeff Bezos told me in an interview last year that artificial intelligence was not just in the first inning of a long baseball game, but at the stage where the very first batter comes up. And, while Amazon doesn't release sales figures for the Echo family, third-party estimates say that, while they are growing fast, they were still well below 10 million units last year. For comparison, even in a relatively weak period, Apple sold 50 million much costlier iPhones in just 90 days last quarter, and the combined total sales of the far more prevalent Android phones no doubt were much greater.

Google just announced that there are now two billion Android devices in active monthly use globally, and Apple announced a year and a half ago that there were over one billion iOS devices in active use. These are mostly smartphones, and they are no longer novel.

Wait for it

But just because you're not seeing amazing new consumer tech products on Amazon, in the app stores, or at the Apple Store or Best Buy, that doesn't mean the tech revolution is stuck or stopped. In fact, it's just pausing to conquer some major new territory. And, if it succeeds, the results could be as big or bigger than the first consumer PCs were in the 1970s, or even the web in the 1990s and smartphones in the first decade of this century.

All of the major tech players, companies from other industries and startups whose names we don't know yet are working away on some or all of the new major building blocks of the future. They are: Artificial intelligence / machine learning, augmented reality, virtual reality, robotics and drones, smart homes, self-driving cars, and digital health / wearables.

All of these things have dependencies in common. They include greater and more distributed computing power, new sensors, better networks, smarter voice and visual recognition, and software that's simultaneously more intelligent and more secure.

Examples of all these technologies already exist, but they are early, limited and mainly attractive to enthusiasts. Compared to what's coming, they are like the Commodore PET (look it up, kids) or those huge car phones in old movies.

Ambient Computing

I expect that one end result of all this work will be that the technology, the computer inside all these things, will fade into the background. In some cases, it may entirely disappear, waiting to be activated by a voice command, a person entering the room, a change in blood chemistry, a shift in temperature, a motion. Maybe even just a thought.

Your whole home, office and car will be packed with these waiting computers and sensors. But they won't be in your way, or perhaps even distinguishable as tech devices.

This is ambient computing, the transformation of the environment all around us with intelligence and capabilities that don't seem to be there at all.

It reminds me of a great Saturday Night Live skit from 2005, where cast member Fred Armisen, playing Steve Jobs, shows off an ever-smaller series of iPods, finally producing a model that's literally invisible, yet holds "every photograph ever taken."

Just in recent weeks, Facebook's famed researcher Regina Dugan has announced that her secretive team is working on using the brain to type, and to control augmented reality devices. They are also developing ways to "hear" through your skin.

Their idea is that, even if augmented reality gets built into standard eyeglasses and can impose sophisticated virtual objects onto real life, it won't be seamless if you have to push buttons, use touch controls or utter commands.

Apple reportedly has a secret project to monitor the glucose levels of diabetics with new noninvasive sensors, ending the need for daily test needles.

Google has changed its entire corporate mission to be "AI first" and, with Google Home and Google Assistant, to perform tasks via voice commands and eventually hold real, unstructured conversations.

Several small firms are pursuing the prospect of recharging mobile devices with power sent through the air, so power cords won't be around.

I expect to see much of this new ambient computing world appear within 10 years, and all of it appear within 20.

Why it matters

Every one of these efforts has the potential to create a new world that's unrecognizable. It's a radically different way of thinking about tech.

When the internet first arrived, it was a discrete activity you performed on a discrete hunk of metal and plastic called a PC, using a discrete software program called a browser. Even now, though the net is like the electrical grid, powering many things, you still use a discrete device — a smartphone, say — to access it. Sure, you can summon some internet smarts through an Echo, but there's still a device there, and you still have to know the magic words to say. We are a long way from the invisible, omnipresent computer in the Starship Enterprise.

Worse, those early computers were in your way. They were hulking objects that demanded space and skill. Even now, if you look around a restaurant, you'll see smartphones on the tables, waiting to be used.

Computers have gotten vastly easier to use, but they still demand attention and care, from charging batteries to knowing which apps to use and when to use them.

Technology has been a great thing, but it's been too unnatural, an add-on to life, for 40 years. What's going on in the labs has the promise to change that.

The dark side

Some of you who've gotten this far are already recoiling at the idea of ambient computing. You're focused on the prospects for invasion of privacy, for monetizing even more of your life, for government snooping and for even worse hacking than exists today. If the FBI can threaten a huge company like Apple over an iPhone passcode, what are your odds of protecting your future tech-dependent environment from government intrusion? If British hospitals have to shut down due to a ransom ware attack, can online crooks lock you out of your house, office or car?

Good questions.

My best answer is that, if we are really going to turn over our homes, our cars, our health and more to private tech companies, on a scale never imagined, we need much, much stronger

standards for security and privacy than now exist. Especially in the U.S., it's time to stop dancing around the privacy and security issues and pass real, binding laws.

But, as tectonic shifts like this occur in technology, oligopolies get shaken up.

And, if ambient technology is to become as integrated into our lives as previous technological revolutions like wood joists, steel beams and engine blocks, we need to subject it to the digital equivalent of enforceable building codes and auto safety standards. Nothing less will do, and health? The current medical device standards will have to be even tougher, while still allowing for innovation.

The tech industry, which has long styled itself as a disruptor, will need to work hand in hand with government to craft these policies. And that might be a bigger challenge than developing the technology in the first place.

The oligopoly

Most of the work on this, especially what we and others can learn about and report about, is coming from the giant companies that make up today's tech oligopoly — Apple, Amazon, Facebook, Google and Microsoft.

But, as tectonic shifts like this occur in technology, oligopolies get shaken up. For instance: today, Apple is the biggest of the group. By all reports, it's working seriously on AR, self-driving cars and health initiatives. But its strict and admirable privacy policies make it harder for it to gather the vast amounts of data required for the best machine learning.

Microsoft is still trying to find a way to meld its formidable software and cloud expertise with a significant hardware business. The ad-based business models of Facebook and Google, now so dominant, could prove fickle. And Amazon has only had one really giant hardware hit — the Kindle — in its existence.

But, even if these oligarchs all do fine, and their ranks swell by one or two, the country and the world will have to ask if they have too much power — and, if so, how to curb it without killing progress.

The bottom line

We've all had a hell of a ride for the last few decades, no matter when you got on the roller coaster. It's been exciting, enriching, and transformative. But it's also been about objects and processes. Soon, after a brief slowdown, the roller coaster will be accelerating faster than ever, only this time it'll be about actual experiences, with much less emphasis on the way those experiences get made.