

# Connecting

Column: Bits vs Electrons

## Connecting

Bob Frankston

■ I WAS THINKING about this column as I was on the way to attend a meeting of ECMA TC53 to talk about JavaScript for small devices (also known as IoT). It was nice that Hertz is now sending me email to tell me ahead of time where to find my car and which model it was. That saves a lot of effort.

The last time I hiked all the way to my car, but they had switched models and there was no way to verify since that part of the garage had neither

cellular nor Wi-Fi connectivity. I had expected to be able to use Android Auto, but the Infinity Q50 not only lacked Android Auto, but the controls were a hodgepodge of screens and buttons. Rental cars are an extreme test of "on-boarding" or initial experience.

The experience reminded me of how far we are from the ability to assume connectivity, be it among the systems in a car or across the world.

### RUSH HOUR 1997

I am sometime in the late 1990's and I am on my way to the office. I see the sun starting to rise which means that the rush hour is beginning, although traffic has already stopped. Usually I avoid this trip since my home computing environment is well connected to the office. In fact, it is a better setup, more homey so to speak. But it is good to get to the office frequently to maintain personal contact and for discussions.

While I am sitting in traffic, I am still connected to the computing environment. I can speak into the microphone on my watch. There is also a small color display there, but I much prefer the eyeglass-mounted display which gives full resolution. In my pocket are my CPU and storage unit. All this is connected via my body LAN. I am still relatively low tech and use a low-power radio packet network. The idea

of running a wire down my arm (like Seiko used to do for their ancient wrist TV) seems silly. Clothing that conducts IR is a tempting alternative but is still not fashionable.

The logo features the letters 'BCS' in large, bold, red, sans-serif font. Below 'BCS', the word 'UPDATE' is written in a smaller, yellow, sans-serif font, with each letter separated by a small gap. A small red arrow points to the right at the end of the word.

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## Preface

I was thinking about this column as I was on the way to attend a meeting of ECMA TC53 to talk about JavaScript for small devices (AKA IoT). It was nice that Hertz is now sending me email to tell me ahead of time where to find my car and which model it was. That saves a lot of effort.

The last time I hiked all the way to my car, but they had switched models and there was no way to verify since that part of the garage had neither cellular nor WiFi connectivity. I had expected to be able to use Android Auto but the Infinity Q50 not only lacked Android Auto, but the controls were a hodgepodge of screens and buttons. Rental cars are an extreme test of "on-boarding" or initial experience.

The experience reminded me of how far we are from the ability to assume connectivity be it among the systems in a car or across the world.

Today the IEEE is excited about 5G because it is supposed to be fast but 5G won't help with the real problem of connecting devices and services. If anything, it will bring us [Connecting/Bob Frankston](#)

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back to depending upon providers. And we still need to understand the myriad ways of interacting with systems.

I wrote the following in 1989 for the Boston Computer Society's magazine and it's still relevant. At the time, 1997 seemed sufficiently far in the future for these predictions.

## Rush Hour 1997

It is sometime in the late 1990's and I'm on my way to the office. I see the sun starting to rise which means that the rush hour is beginning, though traffic has already stopped. Usually I avoid this trip since my home computing environment is well connected to the office. In fact, it is a better setup, more homey so to speak. But it is good to get to the office frequently to maintain personal contact and for discussions.

While I'm sitting in traffic, I'm still connected to the computing environment. I can speak into the microphone on my watch. There is also a small color display there, but I much prefer the eyeglass-mounted display which gives full resolution. In my pocket are my CPU and storage unit. All this is connected via my body LAN. I'm still relatively low tech and use a low power radio packet network. The idea of running a wire down my arm (like Seiko used to do for their ancient wrist TV) seems silly. Clothing that conducts IR is a tempting alternative but is still not fashionable.

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Though voice processing (I prefer not to use the term recognition) is quite useful, I've grown accustomed to using gesturing. Moving my hand through the air is much more powerful than the old mouse as a pointing device. Of course, I don't want to confuse the ma-

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chine, so I tighten the muscles behind my ear as a command mode indicator. Wriggling my ears, even if only slightly, used to seem a strange way to interact with the computer, but I no longer even think that way, I just think about sending a command. This is no different from typing; in fact, it is considerably easier. When I first learned to type I had to pay a lot of attention to what I did with my fingers. After only ten years of practice, I was able to type conversationally with little or no awareness of what my fingers were doing. In fact, I still consider typing to be an important form of gesturing. Typing in the air does look a bit strange, however.

I'm still hesitant about taking the next step of direct nerve connections. The most interesting research involves using the vestigial tail nerves. The other possibility is direct retinal transfer for video. I'll wait until they are better developed.

I hear the sound of someone revving an engine. I chose that audio metaphor as the signal that traffic is moving again. Indeed, the traffic is up to 5kph, the point at which I don't trust the car to drive itself. But I can continue to talk to you since the car is quiet enough. In fact, that was a requirement when I chose this car. You're probably reading the text version of this on your screen. I still prefer that medium as being better for skimming. It also makes it easier to edit. But I'll wait till the office system has had a chance at transcription since I'd rather use the extra capabilities of that system to get a more accurate transcription.

In the meantime, I've gotten an update to my meeting schedule for the day. It came via the cellular data network. I ask (or gesture) for an audio summary so I can continue to watch the road. I know that I'll be able to make some progress now since I get a continuous feed from the traffic reporting system. It is the same one the radio stations use and is well worth the personal use (as opposed to commercial use) price. Hopefully not too many people will subscribe so that I can still take advantage of knowing where the traffic is still light.

Since I don't want to be too distracted from my driving, I get a compressed audio summary of my incoming email. One letter sounds intriguing, so I flag it for visual display when I get my next chance. Since it has

a gigabyte of video, I'll need to give it a chance to get transferred into the car's system.

What I've already gotten are the previews for tonight's HDTV fare. I'll be able to see if there's anything interesting. Unfortunately, there is even less TV than their used to be. Doing special effects for HDTV takes a lot of computing. I might give a try at acting in one of them. No, not for broadcast, just one of those games that integrates my video image into the scene.

But back to my agenda. Stopping off for breakfast will give me a chance to review the agenda without the distraction of driving though I don't want to stray too far from the car's computer and communications link. I can actually do fairly well with just the system I'm carrying but the car's communications capacity is much greater.

I have an alert set in case I have only an hour of unscheduled time. At that point I'd want to personally approve any additional meetings. It hasn't triggered so I presume there is still a little slack in the schedule though it seems pretty full.

It is still early in the morning as I sit down for coffee. I rest my head for a second and hear a loud purring sound. I groggily try to remember what the audio icon is for and look up into the face of my cat. After a little disorientation I realize I'm home. It is still the late 90's but awake I look at the shelves full of documentation. At least the real versions are online on my CDROM and over a network but still I see the titles: X.400, X.500, X.12, ISDN, BISDN, ASN-1, OSI, among others.

The technologies exist to do all that I imagined. In fact, most of them were available way back in '89. Perhaps it was more expensive then, but we've managed to reduce costs and increase capacities. But we still can't get them to talk to one another. I can't quite get my body network interfaced to my car. Cellular packet networking is almost there but not quite. The databases are all incompatible.

Well, maybe next year will be the year of information integration. Or the year after that. And then finally I'll be able to casually peruse the back issues of the BCS Update.

## Rush Hour 2027

If I published this without a cover note and just changed the year to 2027 would people notice that it was written 30 years ago?

With the benefits of hindsight, it could appear that I was remarkably accurate, but the mention of HDTV is telling. I didn't predict it because it already existed though it wasn't until the mid-2000s that it became the norm in the US.

Most telling is that we are still struggling with how to connect information and how to interact with these systems.

It's well past 1997 and I found myself sitting in a rental car, disconnected and trying to figure out how to communicate with the car's systems.

It's telling that I wrote this in 1989 before today's Internet. What I'm really writing about is the ability to interconnect systems. The Internet is just part of the story. It extends the reach of connectivity, but the important connectivity is still local. And I'm still waiting.