

Day 17: In the Beginning, There Was the Command Line

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In The
Beginning...

In the Beginning was the Command Line

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About twenty years ago Jobs and Wozniak, the founders of Apple, came up with the very strange idea of selling information processing machines for use in the home. The business took off, and its founders made a lot of money and received the credit they deserved for being daring visionaries. But around the same time, Bill Gates and Paul Allen came up with an idea even stranger and more fantastical: selling computer operating systems. This was much weirder than the idea of Jobs and Wozniak. A computer at least had some sort of physical reality to it. It came in a box, you could open it up and plug it in and watch lights blink. An operating system had no tangible incarnation at all. It arrived on a disk, of course, but the disk was, in effect, nothing more than the box that the OS came in. The product itself was a very long string of ones and zeroes that, when properly installed and coddled, gave you the ability to manipulate other very long strings of ones and zeroes. Even those few who actually understood what a computer operating system was were apt to think of it as a fantastically arcane engineering prodigy, like a breeder reactor or a U-2 spy plane, and not something that could ever be (in the parlance of high-tech) “productized.”

Yet now the company that Gates and Allen founded is selling operating systems like Gillette sells razor blades. New releases of operating systems are launched as if they were Hollywood blockbusters, with celebrity endorsements, talk show appearances, and world tours. The market for them is vast enough that people worry about whether it has been monopolized by one company. Even the least technically-minded people in our society now have at least a hazy idea of what operating systems do; what is more, they have strong opinions about their relative merits. It is commonly understood, even by technically unsophisticated computer users, that if you have a piece of software that works on your Macintosh, and you move it over onto a Windows machine, it will not run. That this would, in fact, be a laughable and idiotic mistake, like nailing horseshoes to the tires of a Buick.

A person who went into a coma before Microsoft was founded, and woke up now, could pick up this morning’s New York Times and understand everything in it—almost:

Item: the richest man in the world made his fortune from-what? Railways? Shipping? Oil? No, operating systems. Item: the Department of Justice is tackling Microsoft’s supposed OS monopoly with legal tools that were invented to restrain the power of Nineteenth-Century robber barons. Item: a woman

friend of mine recently told me that she'd broken off a (hitherto) stimulating exchange of e-mail with a young man. At first he had seemed like such an intelligent and interesting guy, she said, but then "he started going all PC-versus-Mac on me."

What the hell is going on here? And does the operating system business have a future, or only a past? Here is my view, which is entirely subjective; but since I have spent a fair amount of time not only using, but programming, Macintoshes, Windows machines, Linux boxes and the BeOS, perhaps it is not so ill-informed as to be completely worthless. This is a subjective essay, more review than research paper, and so it might seem unfair or biased compared to the technical reviews you can find in PC magazines. But ever since the Mac came out, our operating systems have been based on metaphors, and anything with metaphors in it is fair game as far as I'm concerned.

1 MGBs, Tanks, & Batmobiles

Around the time that Jobs, Wozniak, Gates, and Allen were dreaming up these unlikely schemes, I was a teenager living in Ames, Iowa. One of my friends' dads had an old MGB sports car rusting away in his garage. Sometimes he would actually manage to get it running and then he would take us for a spin around the block, with a memorable look of wild youthful exhilaration on his face; to his worried passengers, he was a madman, stalling and backfiring around Ames, Iowa and eating the dust of rusty Gremlins and Pintos, but in his own mind he was Dustin Hoffman tooling across the Bay Bridge with the wind in his hair.

In retrospect, this was telling me two things about people's relationship to technology. One was that romance and image go a long way towards shaping their opinions. If you doubt it (and if you have a lot of spare time on your hands) just ask anyone who owns a Macintosh and who, on those grounds, imagines him- or herself to be a member of an oppressed minority group.

The other, somewhat subtler point, was that interface is very important. Sure, the MGB was a lousy car in almost every way that counted: balky, unreliable, underpowered. But it was fun to drive. It was responsive. Every pebble on the road was felt in the bones, every nuance in the pavement transmitted instantly to the driver's hands. He could listen to the engine and tell what was wrong with it. The steering responded immediately to commands from his hands. To us passengers it was a pointless exercise in going nowhere—about as interesting as peering over someone's shoulder while he punches numbers into a spreadsheet. But to the driver it was an experience. For a short time he was extending his body and his senses into a larger realm, and doing things that he couldn't do unassisted.

The analogy between cars and operating systems is not half bad, and so let me run with it for a moment, as a way of giving an executive summary of our situation today.

Imagine a crossroads where four competing auto dealerships are situated. One of them (Microsoft) is much, much bigger than the others. It started out

years ago selling three-speed bicycles (MS-DOS); these were not perfect, but they worked, and when they broke you could easily fix them.

There was a competing bicycle dealership next door (Apple) that one day began selling motorized vehicles—expensive but attractively styled cars with their innards hermetically sealed, so that how they worked was something of a mystery.

The big dealership responded by rushing a moped upgrade kit (the original Windows) onto the market. This was a Rube Goldberg contraption that, when bolted onto a three-speed bicycle, enabled it to keep up, just barely, with Apple-cars. The users had to wear goggles and were always picking bugs out of their teeth while Apple owners sped along in hermetically sealed comfort, sneering out the windows. But the Micro-mopeds were cheap, and easy to fix compared with the Apple-cars, and their market share waxed.

Eventually the big dealership came out with a full-fledged car: a colossal station wagon (Windows 95). It had all the aesthetic appeal of a Soviet worker housing block, it leaked oil and blew gaskets, and it was an enormous success. A little later, they also came out with a hulking off-road vehicle intended for industrial users (Windows NT) which was no more beautiful than the station wagon, and only a little more reliable.

Since then there has been a lot of noise and shouting, but little has changed. The smaller dealership continues to sell sleek Euro-styled sedans and to spend a lot of money on advertising campaigns. They have had GOING OUT OF BUSINESS! signs taped up in their windows for so long that they have gotten all yellow and curly. The big one keeps making bigger and bigger station wagons and ORVs.

On the other side of the road are two competitors that have come along more recently.

One of them (Be, Inc.) is selling fully operational Batmobiles (the BeOS). They are more beautiful and stylish even than the Euro-sedans, better designed, more technologically advanced, and at least as reliable as anything else on the market—and yet cheaper than the others.

With one exception, that is: Linux, which is right next door, and which is not a business at all. It's a bunch of RVs, yurts, tepees, and geodesic domes set up in a field and organized by consensus. The people who live there are making tanks. These are not old-fashioned, cast-iron Soviet tanks; these are more like the M1 tanks of the U.S. Army, made of space-age materials and jammed with sophisticated technology from one end to the other. But they are better than Army tanks. They've been modified in such a way that they never, ever break down, are light and maneuverable enough to use on ordinary streets, and use no more fuel than a subcompact car. These tanks are being cranked out, on the spot, at a terrific pace, and a vast number of them are lined up along the edge of the road with keys in the ignition. Anyone who wants can simply climb into one and drive it away for free.

Customers come to this crossroads in throngs, day and night. Ninety percent of them go straight to the biggest dealership and buy station wagons or off-road vehicles. They do not even look at the other dealerships.

Of the remaining ten percent, most go and buy a sleek Euro-sedan, pausing only to turn up their noses at the philistines going to buy the station wagons and ORVs. If they even notice the people on the opposite side of the road, selling the cheaper, technically superior vehicles, these customers deride them cranks and half-wits.

The Batmobile outlet sells a few vehicles to the occasional car nut who wants a second vehicle to go with his station wagon, but seems to accept, at least for now, that it's a fringe player.

The group giving away the free tanks only stays alive because it is staffed by volunteers, who are lined up at the edge of the street with bullhorns, trying to draw customers' attention to this incredible situation. A typical conversation goes something like this:

Hacker with bullhorn: "Save your money! Accept one of our free tanks! It is invulnerable, and can drive across rocks and swamps at ninety miles an hour while getting a hundred miles to the gallon!"

Prospective station wagon buyer: "I know what you say is true...but...er...I don't know how to maintain a tank!"

Bullhorn: "You don't know how to maintain a station wagon either!"

Buyer: "But this dealership has mechanics on staff. If something goes wrong with my station wagon, I can take a day off work, bring it here, and pay them to work on it while I sit in the waiting room for hours, listening to elevator music."

Bullhorn: "But if you accept one of our free tanks we will send volunteers to your house to fix it for free while you sleep!"

Buyer: "Stay away from my house, you freak!"

Bullhorn: "But..."

Buyer: "Can't you see that everyone is buying station wagons?"

2 Bit-Flinger

The connection between cars, and ways of interacting with computers, wouldn't have occurred to me at the time I was being taken for rides in that MGB. I had signed up to take a computer programming class at Ames High School. After a few introductory lectures, we students were granted admission into a tiny room containing a teletype, a telephone, and an old-fashioned modem consisting of a metal box with a pair of rubber cups on the top (note: many readers, making their way through that last sentence, probably felt an initial pang of dread that this essay was about to turn into a tedious, codgerly reminiscence about how tough we had it back in the old days; rest assured that I am actually positioning my pieces on the chessboard, as it were, in preparation to make a point about truly hip and up-to-the minute topics like Open Source Software). The teletype was exactly the same sort of machine that had been used, for decades, to send and receive telegrams. It was basically a loud typewriter that could only produce UPPERCASE LETTERS. Mounted to one side of it was a smaller machine with a long reel of paper tape on it, and a clear plastic hopper underneath.