

A Software World

In the 20th century, human beings have been learning to live in a software world.
Let me explain.

Since time immemorial, humans have lived in a world of hardware. That is, humanity lived in a world of things that were more or less solid. Some were very solid: Rocks and trees and hills and mountains. Some things were somewhat solid: leaves and grass and rivers. Some things were barely solid: wind and clouds and fire. In this hardware world, humanity fashioned its own hardware, the tools which were designed to make the human lot easier in this hardware world. This was human technology, the wheel, the plow, the oxcart, the locomotive, the automobile, the printing press.

Hidden in the hardware among which human beings lived was a mystery. This mystery was of crucial importance to men and women. The mystery is called "life." Of the various kinds of hardware in the world, some things were "alive." Human beings realized that being "alive" made something something more than just hardware. There was a fundamental difference between a machine and a living being. One could travel on a horse. One could travel in an automobile. But a horse was "alive." An automobile was simply a mechanism whose wheels turned as the internal combustion engine gave them power.

As we lived in this hardware world, humans have closely associated this mystery we call "life" with that realm that we call "religion". That is, in the various traditions that we can find among the peoples of the world, what we call "religion" has pointed us away from the world of "hardware" to something beyond. We have described this "beyond" as "spiritual". The realm of spirit points us beyond things. It points us to the mystery of life itself. It tells us that the meaning of the world is not more than the solid hardware that surrounds us. And so human beings have spoken of things like gods, angels, fairies, ghosts. The sacred, the holy, the mysterious, the magical -- these have been ways that humans have attempted to understand how reality goes

beyond the solid world of hardware in which we live. The distinction seemed absolute. Without spirit, things were things. Living beings were more than just things. We use things. We relate to living beings.

(Now I make no judgment on all of this. I am not trying to explain away religion. Nor am I attempting to say that all religions believe the same things, or have equal validity. Those are other questions. What I am trying to say is that all religions are closely concerned with this mystery we call life and that in a hardware world, the distinction between living things and mere physical objects or tools is very easy to draw.)

Around about the beginning of this century, or perhaps a few decades earlier, all of that began to change. The change was closely linked to the discovery of electricity. What happened is that a new kind of technology began to appear. These new tools did nothing by themselves. They required software to run.

What is software? "Software" is a word we use in relation to computers. The computer itself is hardware. But without a program, a computer can do nothing. A computer, when turned on, can only wait until it receives instructions. The instructions we give a computer, the programs that a computer "runs" are its software. Without software, a computer is helpless. Without software, a computer does nothing.

But computers are not unique. It began, perhaps, with the telegraph. The telegraph is simply a wire connecting a sending key and a receiving device. It does absolutely nothing until the key is pressed. It does nothing useful until the key is pressed in a way that results in the receiving device being stimulated in a meaningful way. Without the message, the hardware does nothing. The message is the "software" of the telegraph. (I will continue to use the word "software" in this rather broad sense.)

Now when we trace the line from the telegraph to the computer, we begin to see how important software has become for us. Think of all

the machines that we use that depend on software. Think of how large a part they play in our life: the telephone, the radio, the movie, the television, the VCR, the phonograph, the tape recorder, the CD. Much of our waking life involves us in the use of machines that require software.

When we use these machines, it is not the hardware that we notice. It is the software that commands our attention. When I use my CD or my cassette recorder, I have absolutely no interest in the fact that something inside is turning around and around and around. I am interested solely in what the player plays, the sound that it produces, the sound that the software programs it to produce. When I watch a TV, I am no more than momentarily interested in how I can change from one channel to another, or how the colour can be adjusted. I am interested in the program, the signal that gives the television its meaning for me, the software that is sent from my favorite station to amuse, inform or educate me. When I use a computer, I am interested in the program I am using. A computer becomes for me an accounting machine or a spreadsheet or a word processor or a database or a game. It is the software to which I relate. The hardware stays in the background. It is only the space in which my software comes to life.

Software is all around us. Some of it is obvious. We are more or less aware of our radios and telephones and television sets. We are aware of buying software in the form of cassettes and CDs and Videos. But we are also surrounded by software of which we are not aware. For example, we drive cars that are highly computerized. We are usually quite unaware to the programs that govern the various CPUs that control the contemporary automobile. We know that now we can push buttons to do things we couldn't do in a car ten years ago. We don't think "computer" and "software" when we drive a car. But the computers and the programs are there, turning our driving into a kind of magic. And not only in cars: computers have also transformed our household appliances. Everything from the kitchen blender to the thermostatically controlled furnace have been transformed by computer technology. In the late 20th century, we live in a very different world than did our grandparents and great-grandparents.

The world of hardware is quickly being transmuted into a world of software.

Now why do I speak of software? What does software have to do with theology? Let me try to explain.

As I said earlier, in a hardware world, we find it easy to distinguish between living things and inanimate objects. The world of living things, as I said, points us to a realm of spirit. And it is the world of spirit, of life, with which religion, in a very broad sense, is concerned. Put very simply, in a hardware world we use things but we relate to living beings. We enter into relationships with animals and people and spirits and God. The life of the spirit is not primarily concerned with things. It is almost never concerned with tools and technology.

In a software world, however, what was clear to our ancestors is not quite so clear to us. We may indeed think that we believe exactly the same things as our ancestors. What we don't always notice is that what we confess with our lips is not quite consistent with our experience or the way that we actually behave. We have changed, and it is software that has transformed us. When we use software, we begin to treat machines in ways that, in the past, we only treated people. No longer do we only use machines. We actually enter into relationship with them.

Most of the time we are not aware of this. One of the reasons that we don't notice the change in our relationship to our technology is that we call many of our software driven machines by the name "media." We think of ourselves as using the machine, the medium, to relate to someone who is a person. The machine is simply the tunnel we go through in order to establish the relationship. When I watch the news on TV I am responding, not to a machine, but to a person: Tony Parsons or Knowlton Nash or Dan Rather or someone else. If I watch a video I am responding to and relating to the actors or the singers who are made present to me through the VCR. If I talk on the telephone I am entering into a relationship with the person with whom I am speaking to through the mediation of the machine.

I don't want to suggest that this way of looking at things is not true. It is quite true. But it is only one way of seeing the truth. Imagine however if you were a hypothetical observer from outer space observing how we behave. If such an observer followed me throughout the day, he or she might say that I start out the day contemplating a TV set, responding with various emotions to what the TV set presented to me. This observer would then follow me to work where I would sit in front of a computer and engage in a conversation with the machine by typing on a keyboard and by responding to what the computer said in return. From time to time, my phone would ring and I would engage in a vocal conversation with that machine. In my car, I would be seen to respond to sounds that came from a radio. In fact, I could go for a full day and an observer might conclude that all my significant relationships were machines. (That would depend on the day, of course. But we do all go through days when our conversations with people who are physically present to us are minimal: simple "hellos" and "how are yous.")

Now we might say that the observer had interpreted my behaviour incorrectly? But is the interpretation actually wrong? Certainly, it is not how I would describe my behaviour. But it is often true that outsiders can see things more clearly than those of us who think we know what we are doing. The fact is that we do relate to machines that are driven by software in ways that our ancestors behaved only towards living things.

Software blurs the distinction between things and persons. Software, in a sense, brings our machines to life. We are forced to relate to, to respond to, the things our machines present to us.

This fact of contemporary technology is clearest with the computer. When I sit down at a computer, there is not usually a person at the other end with whom I converse. I converse with the machine. The language that I use is not necessarily normal English. But it is a conversation. Imagine this series of keystrokes on a PC:

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C:\>dir format.exe
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Volume in drive C has no label
Volume Serial Number is 023815DB
Directory of C:\
File not found

C:\>dir \dos\format.exe

Volume in drive C has no label
Volume Serial Number is 023815DB
Directory of C:\DOS

File not found

C:\>dir \dos\format.*

Volume in drive C has no label
Volume Serial Number is 023815DB
Directory of C:\DOS

FORMAT COM 22875 040789 12:00a

1 File(s) 24096768 bytes free

What this translates into as a conversation in English goes something like this:

User: See if you can find the file FORMAT.EXE.

Computer: I am looking in the main directory of drive C (which has no label and whose serial number is 0238-15DB.) Sorry, I cannot find it.

User: Oh. Well try looking for it on this other directory called DOS.

Computer: I am looking in the DOS directory of drive C (which has no label and whose serial number is 0238-15DB.) Sorry, it's not there either.

User: Hmmm. Oh, I see. Well maybe I don't have the name quite right. Try looking for any file called FORMAT.

Computer: I am still looking in the DOS directory of drive C (which has no label and whose serial number is 0238-15DB.) Yes. Here it is. The file contains 22875 bytes and it was created at midnight on the 7th of April 1989. By the way, you have 24 million 96 thousand 768 bytes available on drive C. What do you want me to do now?

Every time I sit down at a computer, I am engaged in a conversation with a machine. If I were to spend hours and hours on the telephone or watching television, I might never notice that I was relating to a machine. I could go on telling myself that nothing significant had changed, that I was still relating to people, who were somehow on "the other end" of the technological tunnel. But with a computer, I don't have that excuse. When I use a computer I do have a conversation with a machine. There is no escape from that fact. The computer clearly demonstrates that, in our experience, the distinction between things and persons has been obscured. We do not think that a computer is a person. But we do relate to computers in ways significantly similar to the way that we relate to people.

It is only that things are clearer with computers. The same question applies to all the other software driven machines that we use. When I watch television, am I relating to the television personalities or am I relating to my television set? When I talk on the telephone, am I speaking to a person or to a machine? The answer to questions like that is not clear cut. There are senses that both alternatives are true. The distinction between people and things is not as clear as it used to be.

The fact that things have changed is perhaps confirmed by another phenomenon in recent years: the rebirth of magic and its association with science and technology. When I was younger, I read quite a bit of science fiction. In those days, science fiction was science fiction. It had to do with imagined worlds of the future where technology had either triumphed or failed or threatened to triumph or threatened to fail. It had to do with imagining worlds in which science and technology had moved beyond the present state and which therefore had created utopias or living hells.

Starting I think in the late sixties, a new kind of literature began to appear which began to blur the edges of science fiction. These new works slowly began to be called science fantasy. They were worlds of magic, worlds with strange technologies, worlds of witches and wizards, of incantations and spells. These books today can be found in the section of the bookstore called science fiction. The boundary between technology and magic has been blurred.

The fact is that, through software, we live in a world of magic. It was the science fiction writer Arthur Clarke who observed that there is no difference between magic and smoothly functioning technology. In our computerized world we push a button and magic happens. The air is filled with music. We speak to people thousands of miles away. The windows on the other side of the car come down. Many magical things happen, just by pressing a button. With the right incantation, I can command my computer to do many many things. I speak, and it is done.

Is that magic or not? Well, we are intelligent people. We know that it is not magic. Whether we understand the technology or not, we know that there is a perfectly obvious cause-and-effect explanation for why the window on the other side of the car goes up when I press the button and why a few pushes on my telephone's buttons can connect me to someone in Saudi Arabia and why the computer does what I tell it to. We know all that. Even if we don't understand it, we have complete faith that our technologists understand it. We know it is not magic.

But it feels like magic! A technology that invites us to respond, that draws us into a relationship, cannot help but feel like magic. And so, on a subliminal level, if not consciously, our software world has become a world of magic.

Perhaps, then, we can begin to see the importance of talking about theology in the company of computers. Let me name just two questions that we need to think about. The first question has to do with magic. How can one be Christian in a magical world? The second has to do with ourselves. As Christians, we have traditionally

described ourselves as created in the image of God. What does that mean when we find it more and more difficult to draw a sharp line between ourselves and our machines? I don't pretend to have the answers to these questions. I just want to help us to think about them.

Historically, Christians have been very reluctant about magic. Among Christians, Protestants have been most opposed to anything that smacks of magic. There are a number of reasons for this opposition, not all of them commendable. But the central concern, as I understand it, of opposition to magic lies in the Protestant doctrine of salvation by grace. Magic was perceived by Protestants as an attempt to manipulate spiritual things, to have control over one's spiritual destiny. It was seen as ultimately an attempt to gain power over God.

Technology can indeed be an attempt to gain power over God. That, at least, is the implication of the story of the Tower of Babel. With their new technology, brick building, the people of Babel attempted to build a tower reaching to the heavens. If you can do that with bricks, mere hardware, what can you do with computers, our contemporary magic wand? Our ancestors saw magic as rooted in the work of the devil. The spiritual powers that made magic possible were demons. And those who entered into commerce with demons needed to be rooted out and destroyed. That is why witches were burned. Where does our magic come from? What is the real promise and what is the real danger of this new software world in which we live?

That is the first question. The second question has to do with ourselves. Until the world became a software world, Christian theologians had a pretty common way of dealing with the question of what it meant to be human. The key text was Genesis 1:27; "And God created humankind in his image; in the image of God he created them; male and female he created them." (NRSV) Our ancestors said that to be created in God's image was what made humans special. It was what distinguished human beings from "the beasts." And so we were told by many theologians that it was the rational soul that

distinguished us from the other animals. To be human was to be rational. To be less than rational was to be sub-human, a beast.

In a hardware world, that answer served more or less adequately. It had its problems, but by and large most Christians believed it. But today, the problem is different. In a software world, our problem is not in knowing how we differ from animals. Our problem is in knowing how we differ from machines. We relate to machines. We have conversations with machines. And we know, at least in some senses of the word, that our machines can think. Our machines are coming to share our rationality.

I must admit that I do not spend nights awake worrying about artificial intelligence. If machines want to think, that is OK with me. But I do worry a bit about humanity's ability to retain a sense of its own identity in a software world. What are human beings for? That question, put bluntly and provocatively in a novel of Kurt Vonegutt, is a critical question for our time. In a hardware world, human beings knew what they were for. They were here to manage, to dominate, to use the hardware around them. In a software world, we become less sure of ourselves. We are not sure what we are for. We are concluding, I hope, that we are not here to dominate and exploit. And yet our technology makes domination and exploitation possible on a scale never known before.

I don't blame our modern uncertainty on the computer. I like computers. I spend long hours with them. I count them as my friends. But to have computers as friends means that I live in a world that is very different from the world of my ancestors. We all live in a software world. We cannot assume that being human in a software world is something that will come naturally.

The danger of our technology to our humanity has been graphically put for us in the Gulf War. For a month and a half we were treated to the spectacle of a software war. The difference between fact and fantasy was blurred as we saw images which were indistinguishable from those we can see in a computer arcade. A surgical strike was indistinguishable from a Nintendo game. After the manner of a

Nintendo game, we attempted to pack up our computerized toys and go home, secure in this wonderful new order which our software world allows us.

But it was not that easy. Perhaps when I have shot all the Klingons out of the sky at the arcade, the game is over. The magic of the software world is not quite that neat. For many people still have to live with the hardware. We were left with the collateral damage: millions of Kurds and Shiites dying in the streets and starving in the mountains, hundreds of burning oil wells spewing greasy black smoke endlessly over Kuwait. In a software world, what does happen to our humanity? Can we even be human, much less Christian, in the new world order that software magically provides?

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