

"My Optimism Is Off The Chart"

by Kevin Kelly — Sept. 20, 2011

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Kevin Kelly thought about the internet long before many of us were born. He talked with Lars Mensel and Martin Eiermann about the evolution of technology, the future of privacy and the need to believe in the impossible.



The European: In your most recent book, “What Technology Wants”, you write: “We can see more of God in a cell phone than in a tree frog.” What is divine about technology?

Kelly: There is something divine about creation, even the creation of technology. I would draw a parallel to the evolution of life: We might say that a forest of Redwood trees is a reflection of something greater than ourselves. There is transcendent beauty in nature, there is a sense of inherent greatness. Those qualities have been extended and amplified by technology. The best way to understand the manufactured world is not to see it as a work of human imagination only, but to see it as an extension of the biological world. Most of us walk around with a strict mental dichotomy between the natural world of genes and the artificial world of concrete and code. When we actually look at how evolution works, the distinction begins to break down. The defining force behind life is not energy but information. Evolution is a process of information transmission, and so is technology, which is why it too reflects a biological transcendence

The European: You have described technology as the “seventh kingdom of life” – which is a very ontological description – and as “the accumulation of ideas” – which is an epistemological description. Are the two converging?

Kelly: I take a very computational view of life and evolution. If you look at the origins of life and the forces of evolution, they are very intangible. Life is built on bits, on ideas, on information, on immaterial things. The technology sphere we have made – which is what I call the Technium – consists of information as well. We can take a number of atoms and arrange them in such a way as to maximize their

usefulness – for example by creating a cell phone. When we think about who we are, we are always talking about information, about knowledge, about processes that increase the complexity of things.

The European: Where do these comparisons break down?

Kelly: I am a critic of those who say that the internet has become a sentient and living being. But while the internet is not conscious like an organism, it exhibits some lifelike qualities. Life is not a binary thing that is either there or not there. It is a continuum between semi-living things like viruses and very living things like us. What we are seeing right now is an increased “lifeness” in technology as we move across the continuum. As things become more complex, they become more lifelike.

The European: At a certain point, complexity could lead to our inability to fully comprehend technology. We might call it “divine” simply because we lack the ability to fully grasp it.

Kelly: There are many things we don’t understand, and they are not necessarily divine. One of the problems for biologists right now is to distinguish between random and organized processes. If we want to think coherently about the relationship between biology and technology, we need good working definitions to outline the edges of the spectrum of life that we are investigating. One of the ways to do that is to create artificial life and then debate whether we have crossed a threshold. I think we are beginning to see actual evolution in technology because the similarities to natural evolution are so large that it has become hard to ignore them.

The European: You use the language of science. Can the natural sciences conclusively answer the question of what distinguishes a lump of cells from animate life? Or do you reach a point where scientific discourse meets its limits, and religion becomes important?

Kelly: I am not a supernaturalist. I think that the essence of life is natural and subject to the investigation by reason. Quantum physics is science, but it is so far removed from our normal experience that the investigation becomes increasingly difficult. Not everyone might understand it, but collectively we can. One of the reasons we want to build artificial intelligence is to supplement our human intelligence, because we may require other kinds of thinking to understand these mysteries. Technology is a way to manufacture types of thinking that don’t yet exist.

The European: One of the strongest arguments for technological innovation is the potential for expanded opportunities or freedoms. Yet as the saying goes, “freedom without justice is chaos”. So the question is: What kind of progress do we want?

Kelly: Innovation always has unintended consequences. Every new invention creates new solutions, but it also creates almost as many new problems. I tend to think that technology is not really powerful unless it can be powerfully abused. The internet is a great example of that: It will be abused, there will be very significant negative consequences. Even the expansion of choices itself has unintended consequences. Barry Schwartz calls it the “paradox of choice”: Humans have evolved with a limited capacity for making decisions. We can be paralyzed by choice!

The European: Can we condition innovation in order to maximize the potential for good outcomes, and to reduce the chance of abuse?

Kelly: Yes. Most of the problems today have been generated by technology, and most future problems will be generated by technology as well. I am so technocentric that I say: The solution to technological

problems is more technology. Here's a tangible example: If I throw around some really bad ideas in this interview, you won't counsel me to stop thinking. You will encourage me to think more and come up with better ideas. Technology is a way of thinking. The proper response to bad technology is not less, but more and better technology.

The European: You often argue that it is good to decentralize organizational structures, to democratize access to information. If I share that fundamental belief, should I not be cautious about technologies that aim to centralize information or power?

Kelly: I don't think that you can stop or prohibit technologies from developing. Once an idea has been thrust into the world, people will use it. I always think of technology as a child: You have to work with it, you have to find the right role and keep it away from bad influences. If you tell your child, "I will disown you if you become a lawyer", that will almost guarantee that they become a lawyer. Every technology can be weaponized. But the way to stop that is not prohibition but an embrace of that technology to steer its future development.

The European: Do you think that the private sector exerts too much influence over technological innovation and prevents us from having that kind of steering power?

Kelly: Yes. I am not a utopian who believes that technology will solve our problems. I am a protopian, I believe in gradual progress. And I am convinced that much of that progress is happening outside of our control. In nature, new species fill niches that can be occupied and inhabited. And sometimes, these niches are created by previous developments. We are not really in control of those processes. The same is true for innovation: There is an innate bias in the Technium that makes certain processes inevitable.

The European: When you say that some progress is inevitable, do you actually mean inevitability, or just that some developments are more likely than others?

Kelly: I use the term the same way you would describe adolescence as the inevitable step between childhood and adulthood. We are destined by the physics and chemistry of matter. If we looked at a hundred planets in the universe that were inhabited by intelligent life, I bet that we would eventually see something like the internet on almost all of them. But can we find exceptions? Probably.

The European: Is innovation a process that can continue indefinitely? Or does the infinite possibility space eventually run against the constraints of a world with finite resources and finite energy?

Kelly: I don't believe in omega points. One of the remarkable things about life is that evolution does not stop. It always finds new paths forwards and new niches to occupy. As I said before, the essence of life is not energy but ideas. If there are limits to how many ideas can exist within a brain or within a system, we are still very far away from those limits.

The European: You could argue that some technological innovations already exceed the imaginative potential of the human mind.

Kelly: Long before we reach a saturation point, we will evolve into something else. We invented our humanity, and we can reinvent ourselves with genetic engineering or other innovations. We might even fork into a species that embraces speedy development and a species that wants no genetic engineering.

The European: You are advocating a very proactive approach to issues like genetic enhancements and human-technological forms of symbiosis, yet you also stress the great potential for abuse, for

ethical problems and for unintended consequences.

Kelly: Yes, we are steamrolling ahead. The net gain will slightly outweigh the negative aspects. That is all we need: A slightly greater range of choices and opportunities every year equals progress.

The European: What makes you convinced that the benefits outweigh the drawbacks, or that the benefits will not have very disparate impacts?

Kelly: For the past ten thousand years, technological progress has on average enabled our opportunities to expand. The easiest way to demonstrate the positive arc of progress is to look at the number of people today who would want to live in an earlier time. Any of us could sell all material possessions within days and live like a caveman. I have written on the Amish people, and I have lived with native tribes, so I understand the attractions of that lifestyle. It's a very supportive and grounded reality. But the cost of that experience is the surrender of all the other choices and opportunities we now enjoy.

The European: Let us swing the pendulum into the other direction. How much of our independence and cognitive autarchy should we relinquish?

Kelly: The next ten years will show how living with the internet is changing our brains.

We know from literacy studies in Peru that the ability to read changes our brain structure. Our brains are a product of their environment. We don't know how the internet will affect us – but we know that it will have an impact. The more we understand that process, the better we will be able to re-educate ourselves and preserve the cognitive qualities that we should not surrender.

The European: One of the things we have already surrendered is privacy. Where do you see that development going?

Kelly: I think we are still at the beginning. In the right conditions and for the right benefits, humans will share everything about themselves. I would like my government and corporations to treat me as an individual. But in order to do that, I need to reveal myself to them. Absolute customization requires absolute transparency. Other people want to be treated generically, so they don't need to reveal anything. Absolute opaqueness begets absolute generic treatments. It's a sliding scale of tradeoffs, and we are moving towards the side with more transparency and less privacy.

The European: One of the big arguments for Google Plus was that it is very easy to control that slider: If you want to share something with many, you can. If you want to share with a close circle, you can do that as well. Has the empowerment of the individual to control his sharing not kept pace with the dissolution of established privacy standards?

Kelly: Absolutely. We need to restore the symmetry of information: The more we reveal about ourselves, the more we want to know about the people with whom we share information. The idea of privacy is a very recent concept. When people shared large huts, there was no privacy. The reason this was acceptable is that there was no privacy for anyone. The problems begin when some people are forced to be a lot more transparent than others.

The European: The Swiss philosopher Alain de Botton writes, "The logical conclusion of our relationship to computers: expectantly to type 'what is the meaning of my life' into Google." What answers can we expect from technology?

Kelly: My point about technology is that every person has a different set of talents and abilities. The purpose of technology is to provide us with tools to maximize our talents and explore our opportunities.

The challenge is to make use of the tools that fit us. Your technology can be different from my technology because our talents and interests are different. If you look at the collective, you might think that we are all becoming more alike. But when you go down to the individual level, technology has the potential to really bring out the differences that make us special. Innovation enables individualization.

The European: You write: “We have to get good at believing in the impossible”. What is the relationship between pragmatism and an aspirational mode of thinking?

Kelly: I am a practical utilitarian American. I am interested in philosophy, but I believe in getting things done. But I have consistently been surprised by developments. When Wikipedia’s predecessor Nupedia first launched, I thought the idea of an open encyclopedia was not feasible, given what we knew about human nature. Or take Google Maps: I love maps. But if you had told me twenty years ago that there would be a complete zoomable map of every part of the earth for free, I would have called you crazy. Every economist would have told you that such a project is economically impossible. **But impossible things happen. And the only explanation for that is that we really don’t understand the economy or human nature on a theoretical level. When someone now tells me that something is impossible, I am skeptical because I have been proven wrong so many times.**

The European: Is the internet increasing our imaginative or innovative potential?

Kelly: That is a good point. A lot of these impossibilities happen within collective or globalist structures. We can do things that were completely impossible during the industrial age because we can now transcend our individual experience.

The European: The industrial age made large-scale production possible, now we see large-scale collaboration. What is the next step?

Kelly: I love that question. What is the next stage? I think we are decades or centuries away from a global intelligence, but that would be another phase of human development. If you could generate thoughts on a planetary scale, if we moved towards singularity, that would be huge.

The European: The speed of change leaves room for optimism.

Kelly: **My optimism is off the chart. I got it from Asia, where I saw how quickly civilizations could move from abject poverty to incredible wealth. If they can do it, almost anything is possible. Let me go back to the original quote about seeing God in a cell phone: The reason we should be optimistic is life itself. It keeps bouncing back even when we do horrible things to it. Life is brimming with possibilities, details, intelligence, marvels, ingenuity. And the Technium is very much an extension of that possibility space.**