

Wired up for the Digital Future

An interview with Kevin Kelly

Richard A Slaughter

Richard Slaughter. Before we get to your new book *New Rules for the New Economy* I'd like to ask what caused you to write your earlier book *Out of Control*. What was the real starting point and motive?

Kevin Kelly. *Out of Control* came about because I couldn't get anybody else to write it. It was about a lot of the things that I was really interested in and found fascinating, like the Biosphere 2 project, the emerging internet, ecological restoration, artificial life. I felt all of these were deeply connected in some way. I wanted someone to tell me *how* they were connected and explore the larger universe that underpinned them. As editor I tried to get others to take these assignments, but nobody did. In the end I felt compelled to do so myself.

RS. So you dived into this huge area of networks and systems; and you produced big book. It must of taken you a lot of time, a lot of work.

KK. It basically took me full time for three years, during which time I did little else. It was pure pleasure, and an incredible privilege, to have the time off. Of course I was primarily writing for myself - as exorcism essentially. It was an idea that needed to be put out of my mind and onto paper. It was also a way for me to ask the question: how do large systems grow and how do they adapt? How do they govern themselves? I thought that I could help decipher this a bit by bringing together people who perhaps weren't even talking to each other; summarising their views in a book where they might inform each other.

RS. What was the critical response to the book in the USA?

KK. It was ignored primarily. It has done better, both in sales and in getting attention, now that it is four or five years old. When it first came out it was a little too 'far out' I think. But now, one my regrets - my single greatest regret about the book - is that I wasn't bold enough. I think reality has caught up in only four of five years. The metaphor that I was trying to promote - this idea of networks and distributed systems - seemed startling when I started writing in 1990. It was certainly not very fashionable. It seemed pretty left field. Yet now, about a decade later, it has almost become a cliché. It doesn't seem as radical as it was. So more recently I have tried to be pretty bold in *New Rules for the New Economy* by saying the entire economy is following these rules. That seems bold, but it may turn out again that I was not bold enough.

RS. It seems to me that in *New Rules for the New Economy* you've been reflecting on a lot of material over a period of time and that these rules emerge from a long process of reflection, a series of intuitive leaps. Is that right?

KK. Yes, the book evolved from a series of talks I have given and also from the response of people to what I was saying. It emerged over two or three years of talking to business people about their views on what was happening. In *Out of Control* and *New Rules* most of the ideas are not mine. I have only attempted to synthesise, to bring together lots of peoples' ideas and to show how they may be related.

RS. One of the key questions is whether the network or digital economy is really new or, in some sense, just an extension the existing global system. I think you suggest it is something new.

KK. I take the view that it's an evolution from existing economies, but with sufficiently unique and distinctive characteristics that the label 'new' is warranted - just as I would classify human thinking as an evolution beyond animal thinking. It is so obviously different that it can be considered a new type of thinking.

RS. So you see human thinking as an overlay upon on more primitive structures and draw a parallel with that and the new economy?

KK. Yes. It doesn't take a very sharp knife to poke through the human veneer of our minds to get down to an inner core that's very animal-like in terms of reflexes and drives. The sex drive, the drive for food and territory were extremely active in the past, and even today will kick in at the slightest provocation. So, if you look at it as a whole system, a huge amount of our time, day and night, is governed by the animal mind. However, we have this cortex, this thin layer of consciousness and intellect over that, which hopefully distinguishes us and our behaviour as 'new'. It's the same thing with the economy. The inner bulk, the inner core is still predominantly industrial, where diminishing returns and other old rules still hold sway. The new economy does not repeal those dynamics but it does create a vital new context where new rules can emerge.

RS. If I have a concern about that argument it is partly that the old economy can be considered defective in some respects. The way markets operate: the fact they have no ability to care, that they do not embrace the forward view, that there is no 'level playing field', etc. How do these issues affect the new emerging economy?

KK. It means it is not utopia. It is not perfect. It doesn't promise that everyone will be wealthy and it does not cure all the ills or inequalities of society. Two key questions are: what would be a good alternative; and what would we prefer? By and large I think an ideal economy would have many of the qualities of the new economy. We want to use less resources. We want to make sure that there are lower entry barriers to encourage participation. We want to emphasise ideas rather than materials. We want the economy to be less capital intensive and to be global. So in many ways the new economy at least has the potential to incorporate some of those qualities. If I were disenfranchised, I would much rather that the new economy was rolling into town than the industrial economy

RS. Because it creates new options ?

KK. Yes. When the industrial economy developed you had to work in a factory owned by a lot of capitalists. When the new economy rolls into town it may just be in the form of a cellular phone. It gives the chance to use your mind instead of breaking up stones by the side of the road.

RS. From what I have seen of your work, it seems to me that it lacks an analysis of power in the new context. It's more like an exploration of opportunities and how things work. If one

took an analysis of power into this area would there be concerns about power concentrating, or do you think power becomes more diffuse, more shared?

KK. I don't know. If someone asked me to explain the notion of power, I don't know if I could do a good job. I probably don't know what it means.

RS. Well, a similar concern might be connected with the fact that you suggest that computer chips are going to be included in just about every new product, and this seems to be an irreversible trend. Aren't you concerned that with technology and economics driving this powerful change process, we are heading into an over-determined world? It's beginning to look as though we don't really have a choice about whether we want our environment saturated with 'clever' devices, because it's going to happen anyway.

KK. Well, this issue of technological determinism is being raised more often. It is a fascinating question because I believe that our society is an interplay between culture and technology - that technology shapes culture and culture shapes technology. It's like the nature/nurture argument. It is difficult to unravel the paradox of whether you are primarily a product of your genes, or whether your personality is created more by environmental factors. I doubt that this question will ever be completely resolved. All we can say is that both sets of forces are involved.

However, there are advantages in exploring how far we can push the argument on either side of the debate. This is, I think, where we are right now with technology and culture. I am exploring an extreme view that technology determines where we go. I don't really believe that we have no influence on it, but I think it really warrants us to ask the question what does technology want? So that is the question I am asking. What kind of an economy does the technology that we are making produce?

RS. There is a related issue about technology giving us everything to live *with* in instrumental terms, but nothing to live *for* in terms of purpose. It's a question of values in different domains. If we take the view that there is an inner and an outer world, and a individual and a collective one, then it becomes possible to begin to sort out, and perhaps begin to balance, the internal and external, the individual and the collective. In this context should we not begin to ask if this huge wave of technological development is too one-sided because it creates new possibilities and options in one domain - the outer world - but leaves the inner world unsatisfied, so that people are searching for something that technology can't supply?

KK. Yes, I think it does. It's a very good analysis and one of the reasons why we are going to see a tremendous corresponding reaction in spiritual desires and religions. I think John Naisbitt has a wonderful phrase he calls 'high-tech high-touch'. It's the idea that for every corresponding leap we make in technology we will make an equal and opposite leap back to the inner sanctum. I don't think technology gives us much meaning at all. It has developed in a vacuum of meaning. However there are many reasons why I am interested in paying attention to technology. So far there has been pretty much of a lame, if not vacuous, response to technology with spiritual values. In that vacuum, technology has yet even more influence because we don't bring strong values to it. So for the immediate future in the absence of those values, technology is determining where we are going.

RS. So you would expect to see some sort of reaction over time?

KK. Absolutely.

RS. And what form do you think that might take?

KK. Cults, spiritual practices, new theories of everything, genuine piety and belief.

RS. Is it possible that the most interesting futures may be those where some sort of balance is achieved between human and social development on the one hand, and technical development on the other ?

KK. I don't anticipate a balance because I am not a utopian.

RS. Is it not worth considering what kind of civilisation we might create if our human and social capabilities were to match the technologies that we are currently developing?

KK. Yes, but I think there is a total absence of meaning in general, in our society right now. I came across a metaphor somewhere about how modern man, a modern humanist, is like a balloon that is being inflated. The ego keeps growing but identity and meaning gets stretched ever thinner. This is Jay Olgilvy's point about how 75 per cent of Americans interviewed agree with the premise that they are very important - but they have no idea who they are. So we have this balloon inflating and ego getting bigger and bigger and their identity shrinking and getting thinner and thinner and any moment the whole thing could just pop! That is my image of the modern personality. So meaning is in tremendously short supply.

RS. You suggested 10 new rules for the new economy, but I am wondering if there is a single image or meta-rule that stands out for you personally; something that binds the whole thing together?

KK. How to reduce it all to one rule? I guess, the meta rule would be what came out of *Out of Control* - the sense of what happens when money spins out from a few favoured lines of exchange, into a kind of a ubiquitous, constant, global, 24 hours, 365 day a year, million-object exchange. So it is less a rule than an image. The image is of an expanding economic conversation that includes not only everyone in the world but every object and virtual object in the world.

RS. So it's a vastly interconnected, ramified, complex, dynamic environment?

KK. And not just a human one either

RS. One of the notions that came up in *Out of Control* was that complex systems survive because they anticipate. That certainly reinforces my own views about the value of applied foresight. But given the kind of image that you have just outlined, and the extreme dynamism of the world you describe, anticipation would appear increasingly difficult. The message seems to be "stay on the creative edge, learn fast, adapt quickly." Under such conditions the ability to exercise foresight seems problematic.

KK. Yes. You're right that there aren't many very highly evolved mechanisms for anticipation. I think I would try to clarify the idea that anticipation doesn't always mean predicting the

future. Rather, it refers to the ability to incorporate change in systems, so that the system acknowledges, and acts on, and accounts for change. Generally speaking, adaptive systems are doing that - even though they may not be highly intelligent and their operation is of a lower kind; but that is still anticipation. By the way, I am not one who sees the internet and other developments as the new 'overmind.' I think this new economy is anticipating but maybe not at the level you're thinking of where humans are trying to steer the system. In fact, I don't see us knowing enough about it to be able to steer.

One of my assumptions and premises about systems is that if you think about our relationship with nature, it's very ambivalent. One of the things that the ecologists and environmentalists have taught us, which is absolutely true, is that you've got to obey nature and her laws. For example, to have viable species, clean water, etc. wild areas have to be a certain size or they don't work. You've got to operate at certain levels and within certain parameters to keep the system going. You have to work with nature. At the same time it is very obvious that we have hacked away at nature to keep it out, tame it, domesticate it, build houses, make vaccines. So, while we have to work with nature, we have sometimes to do other than what nature wants.

When we work with nature we find it awesome and beautiful and lovely. When we tame nature we are being domineering. That's similar to what is happening with technology as it gets more and more complicated. There are times when we have to work with technology and do what it wants. We have to find out what it wants, the way we find out what nature wants, and let it do what it wants. There are times when you pick up the hatchet and just whack it back. We often take the view that technology is something that we control and nature is something that we submit to. But I think we need to do both. We have to not only work with technology and have it submit to us; there are times when we need to submit to technology. Just as the surrender to nature makes us nervous, we find the idea of surrender to technology very frightening.

RS. You said somewhere that giving the machines freedom is the only way we can have intellectual control?

KK. Yes. This gets us back to *Out of Control*. When you have very complex systems, control in the way that we normally think of it fails and things just get worse. It's like being autocratic with children. The only way to manage a child is exert control indirectly. The same is true of technology, which is very much our child. If we try to control it directly and autocratically it will rebel, so we have to exert control indirectly.

RS. As you know, science fiction writers have rehearsed these themes with stories of dystopian scenarios, robots out of control, plagues upon the earth and so on. Vernor Vinge also wrote about what he called the 'technological singularity', a time perhaps 20 years ahead when powerful technical innovations including artificial intelligence, biotechnology, nanotechnology, micro-computing so on, interact to create something so new, we might not be able to see our way forward. Is that partly what you are thinking of when you talk about not being able to control technology ?

KK. No. I'm not concerned with a future where machines become so intelligent that they create descendants which are smarter than they are, which escape us and pass beyond our understanding. I am not suggesting anything that far fetched. What I'm talking about can be seen today on the internet. One of the interesting features of the internet is that no attempt is

made to control the route of any message that goes through it. The reason why it works, and is so adaptable, is that there is a 'package switching' mechanism that takes over. It is inefficient; it contains many redundancies. But no one is worried about the fact that you do not know exactly how messages are sent. In order to have something robust and adaptable you accept that kind of uncertainty, inefficiency and redundancy.

RS. Let me go back to *New Rules for the New Economy* and imagine that the book landed fresh on the desk of a CEO or director of a company. As the author, what would be your ideal way to see your work taken up and used.

KK. I don't try to offer a blueprint for people to run their business. That was not really my intent. I would be delighted if the CEO came away with a general sense of three or four trends, that seemed to him or her to be fairly obvious. Trends that would then become helpful. Imagine that in 1960 I was able to convince you as a CEO that there was going to be a trend that would be ruthless and strong for the next thirty to forty years; and that trend would see computers continue to get quicker and better and cheaper every year. If I really convinced you of that, it would be an unbelievable asset and advantage. That single piece of information, that broad, general, almost metaphorical piece of information would be very powerful if you really adhered to it.

RS. It seems to me that one of the very positive things you are offering here is a number of metaphors, language, to come to terms with new phenomena. Without concepts and metaphors they would be very difficult to see.

KK. Yes. I think language is really very important. Dictators and others such as George Orwell knew that if you control the language, you shape a lot of the culture and where it goes. So I am certainly trying to offer metaphors and language for thinking about what I see as a very overriding trend toward a world of: embedded computers, high global interactivity, continued decentralisation, increasing marketism and other things. There seem to be a number of related trends that, in my view, are powered by very similar things - communications technologies and chips. So I think one can go pretty far in writing about how these forces are having real effects.

RS. And of course it isn't a completely deterministic process because, as you said earlier today, you personally made the choice not to have a television in your house.

KK. That's right. Individuals and society presumably have the ability to take out the machete and cut off technology at any point. I am not fatalistic in that sense. I am not saying we have to necessarily do what technology wants. I am saying that we have to ask the question about what the technology wants.

RS. As you know, others have looked at these questions from different viewpoints. Why do you think there is such an apparent gulf between the folk who are represented by WIRED magazine, who are generally upbeat, positive, engaged with development of the internet and everything that involves, and the wider Futures community? Why don't the two groups interact more fully and get on better? It seems to me there is a bit of a gap at this juncture.

KK. Where have you detected this gap ?

RS. I saw an account written by someone from the 'net' side of a meeting of a big futures organisation. The article suggested that Futurists had really lost the plot. I am not aware of much dialogue between the people who read WIRED and the people who read say, Futures, or Futures Research Quarterly. My perception is that there seems to be two different communities that share an area of interest, but at the moment they are not interacting very much.

KK. Well, I went to a couple of World Future Society meetings and I found them brain deadeningly boring. Stuart Brand and I attempted to discuss this a couple of times. He had some better theories than I did. I am not sure why this is. Although there is a lot of grey hair at the Futures Society, that may be part of it, but that seems to me to be more a symptom than a cause. I agree there is a gap - it reminds me of the gap between the cybernetic folks and the artificial life guys which in theory there should have been a continuum. But they did not talk to or know each other, there was no shared vocabulary, no shared funding or no institutions. I don't know. There may be a different sensibility.

RS. I wonder if it is sub-cultural thing? The net is driven by small companies, large companies, Silicon valley, a lot of young men and more young women these days, people who read WIRED. Those who do formal Future Studies tend to be older and not linked so much to businesses and corporations. Some see it more as an academic enterprise. It seems to me that you have two related sub-cultures and it would be desirable for some of them to cross the interface and dialogue more fully with each other.

KK. It would be good. There definitely is a gap, I don't have a fully formed theory. I don't read their publications and I avoid the meetings. In a way I have written them off... I am a 'bad boy' that way.

RS. You've distilled your views over a long time. You've written a couple of books; you're doing seminars and workshops. I would imagine that for you there is inevitably a kind of growing familiarity with this material. At this point, what are some of the new lively stimulating, leading edge ideas?

KK. The answer, and I don't mean to be glib about it, is that this is what WIRED magazine is all about. Basically it's my report on the things I find interesting and have done so for the six or seven years. Where my interests are comes out in WIRED, sooner or later. There are things I am thinking about now that have not yet gone into WIRED. For example, I have an interest in time capsules, their meaning and what they are doing. I have interests in the 'biological underground', by which I mean that there is a lot of research on potential and post-biological systems that is not getting into the news. Maybe researchers are gun-shy or too competitive. I'm thinking of the kind of things we saw with Dolly, (the cloned sheep), of which we will see many more. Cloning came out of the blue and everyone was dumbfounded. A number of other announcements and discoveries will also come as if from nowhere because the research is not widely known. There are other things happening with economics that is more refined than my own, mostly macro-economic, stuff. There is work in behavioural or experimental economics. I am trying to pay attention to interesting micro-economic work about the web which I find very powerful. For example, we are trying to learn how to make, and manipulate, mini-markets; what one person calls 'exotic markets'.

RS. Are you interested in nanotechnology?

KK. Not really. I see it just as engineering For the next five or ten years they are going to do everything I expect them to do.

RS. It is just too 'far out' right now ?

KK. Well, no. The revolution may be too far out. Am I excited by advances in computer technology ? I know that things are going to get smaller and faster... I expect that. But there are no surprises there. Nanotech is not going to change anything right now, because we are all expecting it.

RS. So in a sense what you are doing through WIRED is keeping your ear to the ground ? Listening for new signals, the new, the novel, the interesting?

KK. Right ... and the cultural implications. I am still completely fascinated by, even obsessed by, Burning Man-type cultural events. This is an event in the Nevada desert where a relatively small group of people, maybe 15,000, gather for a weekend and create a city. I find it deeply fascinating, partly for the things they are doing, partly because they are doing it at all, partly because of the sheer beauty of the art they are creating, the weirdness of it, the tribal nature of it, the semi-religious aspect of it. I am interested in techno-cults, particularly Russian ones. And I am still interested in the Amish.

RS. Did WIRED assist in the creation of the Long Now Foundation?

KK. No, that was Stuart Brand and Danny Hillis. I am on the board, and there is a GBN connection. It's a fantastic project...the prototype is almost done... four feet high. The idea is to build a clock the size of a building that one can walk into. The clock ticks for ten thousand years. There is a library about long term studies and long term responsibilities. The idea is to create an icon, to expand your 'now' beyond five years past and five years ahead ... to make it an awareness of a thousand years past and a thousand years future. Part of the project is something we call the Golden Canon.. That is about ten thousand books, tomes, videos that we feel contain the essential knowledge of civilisation. That is where my interest in time capsules came from. It is close to the whole Earth Catalogue idea: what are the tools and information to make civilisation in the outback? The Golden Canon is 10,000 works of humankind. How do you decide what they are? How to you arrange the content?

RS. I've long been interested in what I call the 'archive problem.' We are now storing massive amounts of data on volatile media. To retain that over a long period of time implies not just up-dating the records but actually moving it from platform to platform. I would think that there are relatively few sequences that will be positively copied and transformed generation after generation. Are we in danger in the 'wired era' of losing touch with a lot of the knowledge we actually have?

KK. Yes. We absolutely are. We call it the 'digital continuity' problem. One of the few official things the Long Now Foundation has done is to co-sponsor a meeting with the Getty Foundation on this very problem to discuss possible remedies to it. The Getty Foundation issued a report. One of the things that came up again and again, was the notion that data needed to be 'loved' (not the word we used), 'exercised' and cared for, attention given to it. Every so often you need to 'exercise' the knowledge. But that would only happen if people

were paying attention to it. There were other problems. We found that we needed to create a new type of classification system for information. The issue of 'exercising' material was straightforward when you had textual material, but less so when you had a complicated 3-D model which could not be easily abstracted from its platform. But in order to 'exercise' something you might not have access to the original platform. You'd need emulators - software to mimic the latter. Yet keeping track of the emulators was itself difficult. If you lost the emulators you lost the data. So the short answer is, yes it is a problem. It's more of a long-term problem than anyone realises.

RS. It's a problem that will arise with any long-term time capsules?

KK. Yes, one of the interesting facts about time-capsules is that 95 per cent of the hundreds of thousands of them buried in the US in the last 100 years have disappeared within ten years; disappeared in the sense that no-one knows where they are. Some of them are giant, many ton units. What happens is that people forget so quickly. In 10 years the people who worked on the project move away. We need some way to ensure people don't forget. But if they don't care they will certainly forget.

RS. So this suggests a new social role for data guardians, or something similar?

KK. That is what the Long Now Foundation is trying to do. The most interesting question is not how to transmit data over a long period of time. It is how to translate goals and values. Unless you have a reason to save something, unless you have a goal or higher value, it doesn't mean anything. How do you maintain care of something over a long period of time? The Ise Shrine in Japan gets re-built every 100 years. The reason they do that is that they are translating a kind of devotion, a kind of passion for certain values. In the long term time capsules don't really transmit values; these have to be transmitted in other ways.

RS. So perhaps that is the problem we are left with among all this dynamism and change. How do we create and maintain social values during a period of transformation?

KK. Yes that is what is so interesting about the book *Built to Last*. The authors did a study of companies that lasted more than a 100 years such as Universal Studios, Disney, Dupont and 3M. They compared these legendary companies to other similar ones. They found that each of the former had a small and strong set of core values that were transmitted over time without much deviation. Beyond that anything and everything changed.... including the business they were in, including nationality. The only thing that was constant was the core of values.

RS. So one of the biggest keys to the future lies in the whole arena of values and how we maintain them?

KK. Yes. I think when you have a world of increasing options, cascading opportunities, infinite choice, that values are a way of cutting through that and making choices. You do not have time to evaluate all the options. You have to have some heuristic, some guidelines, to go through them, and I think that is what values help us to do.

RS. So basically, at the end of the day, you've a fairly up-beat view of the future; a view which suggests that we can move on successfully beyond the industrial period?

KK. By temperament, I am optimistic. I think we have increased power in the sense of influence on our environment, power to do good and do harm. There will be people who will abuse this and do harm with it, crimes, negative things. But I am optimistic because I think in the end we increase our opportunities and the possibilities, and that is a good thing. The way I like to express it is that technology is a type of thought, it's human-made things. It's thought put into form, into materials. It is actualised thought and some thoughts are better than other thoughts. Some technologies are better than other technologies. Maybe some technologies should not have been made. Call them bad thoughts. The response to a bad thought is not to stop thinking, to have no thoughts. The response to a bad thought is a better thought. The response to bad technology is better technology.

RS. Kevin Kelly, thank you very much for your time.

Note

At the time of the interview Kevin Kelly was executive editor of *Wired* magazine and a GBN network member. He is the author of two influential books: *Out of Control* (Addison-Wesley, 1994) and *New Rules for the New Economy* (Fourth Estate, 1998). His work has also appeared in *Harpers*, *Esquire*, *HQ* and other magazines. Kelly explores correlations between nature and life in a networked society and suggests strategies for coming to grips with an increasingly wired world.

An edited version of this interview was published in *the ABN Report* 6, 9, 1998 pp 3-8.