Dark Innovation

An Interview with Jerry Michalski

by Peter J. Denning, Ubiquity

Editor's Introduction

As computing technologists, we tend to think of innovations in terms of new products or services supported by, or made of, computing technologies. But there are other types of innovation besides products. There are process innovations, such as McDonald's method of making hamburgers fast; social innovations, such as Mothers Against Drunk Driving; and business model innovations, such as Starbucks replacing a coffee shop with an Internet cafe. In all these categories, we tend to think of innovations as new ways of doing things that positively impact many people.

Jerry Michalski, a long-time technology and social networking analyst, wonders why we do not pay more heed to "dark innovations"—new ways of doing things that negatively impact many people. He finds dark innovations all around us, many facilitated by information technology. Michalski thinks we should wake up to this phenomenon so that more do not sneak in on us. We asked him to discuss dark innovation.

Peter J. Denning
Editor

 ©2012 Association for Computing Machinery

Dark Innovation

An Interview with Jerry Michalski

by Peter J. Denning, Ubiquity

Ubiquity: You've been talking a lot to various audiences about "dark innovation," a fascinating name. Before we dig into that, please outline your professional path to this point.

Jerry Michalski: I spent a dozen years as what I call the "accidental technology analyst." Though I had neither a CS nor a journalism degree, I got to write about the newest technologies and their effects on business and society. My actual degrees are in economics (mostly econometrics) and business, from UCI and Wharton, respectively. The econ undergrad let me take classes from other schools at Penn, which probably got me started down my broad, integrative path.

My most memorable courses at Penn weren't in the business school at all. Three stand out for me. One was in "Social Systems Science" from Russell Ackoff, one of the originators of systems thinking. The second was "History and Theory of Urban Design" from Ed Bacon, former city planner of Philadelphia (and father of actor Kevin Bacon). The third was "The Ethnography of Speaking" from Dell Hymes, a world-class social scientist.

Of these, Ackoff was the greatest influence. He convinced me quickly that there's hardly ever such a thing as a problem in isolation: There are systems of problems with complex interactions.

Ubiquity: How did you get established as a technology analyst? Did you become an expert user of social media in the process?

JM: After grad school I did strategy consulting for a few years, and then found my way into technology with a small market research firm named New Science Associates. There I discovered I was pretty good at bridging what tech people were saying to what business people needed to know. I spent the next dozen years doing that.

 ©2012 Association for Computing Machinery

At New Science Associates, I created two "internal startups": a research service named Intelligent Document Management, which launched in 1990, and another named Continuous Information Environments, which launched in 1992.

In 1998 Esther Dyson asked me to join her in New York City to write her monthly newsletter, *Release 1.0*. At the time, her newsletter was one of the top two or three places where any startup wanted to get ink, and her conference, the PC Forum, was where the technorati met and greeted. Every startup wanted us to write about them. What a place to be for a ringside seat to the advances in information technology! I estimate I heard three to four thousand pitches during that time.

Then the Internet showed up, and as the cliché says, it changed everything. It changed who has access to what information, how we hear about things, how services are built, offered and delivered, and what is the very nature of many sectors of the economy. It was fantastic to be a part of that change.

During my tenure as an industry analyst, the topics I cared the most about were those that helped people connect and collaborate. Back then these went by the names of CSCW (Computer Supported Collaborative Work) and groupware; now they've evolved into social media and social business. Social is in.

From all this I may have developed a black-belt perspective on social media and where it might be headed, but I'm only a brown-belt user of social media. Blogging hasn't been my sweet spot, and I don't have a huge, enthusiastic following on Twitter and Facebook. I watch in amazement as some of my colleagues move tens or hundreds of thousands of people when they speak in these media.

Ubiquity: How long have you been following the workings of innovation? What got you interested in it?

JM: When I was at Wharton for my MBA, innovation was already an urgent strategic objective for businesses. That was the era when FedEx built its Cosmos tracking system and American Airlines built Sabre, revolutionizing their respective industries. Suddenly, CEOs everywhere were looking to their newly minted CTOs for the keys to competitive advantage.

Many earlier events combined to form my curiosity, including my growing up in South America, my Dad's own curiosity and watching James Burke's "Connections" series on TV (which affected me in the same the way Carl Sagan and Ayn Rand affected many others). These experiences

 ©2012 Association for Computing Machinery

gave me a wide lens on change. When at Penn I had a brief exposure to a development field called appropriate technology, it started me thinking about what might be inappropriate.

I also have an insatiable appetite for history, particularly history that offers deeper insights about change over time. So for me innovation got wrapped in a larger envelope of notions about how society, business, and government interact, as well as the twisty paths of progress. (Here's a link to my "history canon" in my online Brain, which is a whole other conversation about innovation: http://webbrain.com/u/12fB.)

Ubiquity: Most of us think of innovation as some sort of positive change from products or services in the marketplace. In a recent presentation, you collected a large number of examples of innovations in other areas including social innovation, innovation by the poor, and dark innovation. Why did you start collecting these "other" kinds? Why do you want us to be aware of these kinds of innovation?

JM: This particular set of perspectives on innovation arose from a planning conversation with a colleague, who had lined up a series of excellent speakers for a small seminar about innovation, discovery, and curiosity. He called me to brainstorm the agenda. As we spoke, it dawned on me that all the speakers he had invited were going to take a very scientific, rational, Western approach to the topic, and that a very broad spectrum of opinions on the innovation would be missing from the seminar conversations. So I asked if I might represent the missing perspectives, and he agreed.

In retrospect, a major influence framing my approach was Howard Zinn's important history book, *A People's History of the United States*. Zinn writes about U.S. history from the point of view of the populations who lost various battles during the country's rise, from indigenous populations to slaves brought from Africa, child laborers, women, and others. It's an eye-opening book that offers perspectives most of us never think about. The usual accounts of history are written by the victors, who are inclined to write the vanquished out of history, or at least into history as deserving their fates.

My selection of social, dark, and poor innovation wasn't the result of a systematic taxonomy. It was instinctive. But it worked well as a contrast to the other speakers with their Westernized perspectives. One began by starting the history of innovation with Socrates and Plato, then stated not much happened for a thousand years until the Enlightenment. I was boggled. Remember pyramids? Aqueducts? Stonehenge? Domestication of animals and plants? Writing? Indigenous medicines?

 ©2012 Association for Computing Machinery

The seminar audience also included high-level policy makers. I was delighted with this because all too often important perspectives are omitted from high-level settings. These omissions are mostly unintentional because of consensus biases of how things work and what matters. Outsiders seldom get a seat at the table, which is one of their justifiable and longstanding beefs.

Ubiquity: Are you saying that the people who want to foster innovation are blinded by their ways of thinking?

JM: I see many intelligent people—usually privileged, educated, and scientific—talking about innovation and trying to foster it, generally with good intent. I think they have become trapped in baked-in preconceptions about how innovation works; preconceptions that keep them from looking at (or believing in) the stream of important social, dark, and poor innovations. They are blinded by their taboos. I'm trying to help them see, partly so they don't get blind-sided, and partly because I see so many social, poor, and dark sources of innovations that don't spring from the classical, logical, and positive sources, including those that disrupt legacy businesses.

Ubiquity: What do you mean by taboos of innovation?

JM: I do not want to be trapped by a narrow definition of innovation—the normal fare of faster disk drives or better-tasting toothpastes. Many innovations punch through cultural or conceptual barriers, often doing things that seemed impossible to do from within the old frame of mind. I think most important innovations break taboos, the customs that prevent people from doing things.

The taboos I was challenging by representing social, poor, and dark innovation were, respectively:

- Innovations come from one person with one big insight.
- Innovations come from people with resources and education.
- Innovations are always beneficial, always good for us.

The new ways of thinking exposed by innovations that broke these taboos are:

- Innovations are social.
- Innovations can come from poor, uneducated people.
- Innovations can produce negative value.

 ©2012 Association for Computing Machinery

I'm not saying that innovators in the social, poor, or dark sectors ignored taboos. In most cases, the conventional wisdom was entirely outside their ken. I'm talking about "innovation experts" whose thinking is blinded by these taboos.

Ubiquity: Let's focus on dark innovation. What is that?

JM: Dark innovation is the most controversial of the three I chose to represent. It's a dark side, where we get a change that many people don't find valuable at all.

War is an obvious example. Through the ages we have seen new weapons, tactics, and strategies that aim to kill faster and more efficiently to win wars. Stirrups, longbows, crossbows, gunpowder, repeating rifles, machine guns, chemical weapons, TNT, missiles, napalm, the atomic bomb—all are famous examples of game-changing war technologies. Although these technologies are usually seen by the side that has them as ways of bringing wars to a faster close, they usually don't. Killing is clearly a dark activity, and is all too often entirely avoidable.

The many medical innovations that came from warfare and have saved countless victims of trauma from dying, such as the "Golden Hour," are hard-won wins for society. This dark art has a silver lining.

Now let's take a look at something more prosaic: The protection of ideas. Let's look at the innovative uses of technology and law to protect copyright.

In 1790 the U.S. passed its first copyright act, roughly emulating the 1710 Statute of Queen Anne in Great Britain. In that far slower age of sail and manual printing, copyright holders had to apply for copyright. Once granted, they held it only for 14 years, renewable once to a maximum of 28 years from the publication of the work.

Publishers have a natural interest to limit competition by keeping other publishers from publishing versions of their works. What better way than to retain exclusive rights for as long as possible? Over the years, lawmakers, pressured repeatedly by publishers, extended copyright. Over and over. Today, corporate works are covered for 95 years after the death of the author (not the publication of the work, as was the case before 1973). Thus, a publisher whose author outlives his publication by 40 years gets a copyright term of 135 years.

The most recent U.S. copyright act, passed in 1998, is known as the "Mickey Mouse Act" because it was championed by the Walt Disney Studios so as to keep the famous mouse from falling into the public domain. The way the laws are now written, we won't get Mickey Mouse

 ©2012 Association for Computing Machinery

in the public domain for seven generations! This is out of whack in the age of instantaneous, inexpensive, worldwide communications.

In the past 20 years, managers and programmers have become part of the copyright story. The 1998 Digital Millennium Copyright Act made the circumvention of technological copyright protection schemes a felony. You can go to jail for breaking a lock code on a digital disk. Under this law, any form of DRM (Digital Rights Management), including forms yet to be invented, is protected under the law.

Now everybody is joining the party. Media and hardware companies now expend a great deal of ingenuity, manpower, money, and political capital to handicap the devices people buy, all to make sure that only the original copyright holder has exclusive rights to distribution for the next century. When we buy these devices, we're financing that payload.

These developments will only disturb you if you believe that the public domain, the Commons, and fair use are important to civilization.

Over-extended copyright law is a great example of dark innovation. The U.S. Constitution provides for a nice head start as an incentive for innovation, not infinite control. In the presentation referenced above, you'll see many more. The process of people trying to protect their businesses by using technology and the law to exclude competitors has become ubiquitous.

Strangely, this process is not part of our normal conversations about innovation. Instead, we often talk about innovation as being consistently good for the public: Scientists will fix what ails us, innovators will take our economy back toward growth and health, and so on. I don't buy those narratives.

You can see right away that "dark" takes an ethical stance.

Ubiquity: The examples you gave above seem to depend on some people getting the political system to enact laws or regulations that coerce the behavior they seek. Instead of finding a business model for success in the networked age, some businesses try to preserve their inefficient models by supporting politicians who want their support for reelection. Does dark innovation require the backing of a government or perhaps coercive force to work?

JM: Dark innovation indeed gets the most leverage when it can shape the instruments of collective coercion, which means shaping laws and regulations.

 ©2012 Association for Computing Machinery

But there are many other ways of having an effect. Next up is using mass propaganda or spin to change the public's aspirations and shape public opinion. Consumerism isn't mankind's state of nature. If it were, would so many dollars be needed to convince us to want more and spend more?

Slogans that reinforce unfounded cultural conventions don't help. For example, scarcity does not equal value. Time does not equal money.

Other slogans are made up to try and sell new, unfounded cultural conventions. For example, "trickle-down" economics is widely discredited, and the "ownership society" helped sell us the recent financial meltdown.

We seem to have a deep cultural hubris that we are, today, in our Western society, at mankind's apex of civilization, living within systems that, while not perfect, are as good as they might be. Many consider it a heresy to criticize the status quo, or to suggest other ways that society might be structured for greater collective benefit.

I've found that diving into history helps you see the positive and negative patterns and overcome the cultural hubris. My favorites include the Zinn book I mentioned, plus *The Great Transformation*, by historian Karl Polanyi; *The Underground History of American Education*, by John Taylor Gatto; and *1491: New Revelations of the Americas Before Columbus*, by Charles Mann.

These books may make you feel uncomfortable because they challenge conventional wisdom. Your discomfort will incline you to dismiss the insights offered. The authors will show you that some of your cherished innovations may not be good for everyone, and that you may have been a supporter of dark innovations. Acknowledging and understanding dark innovations takes patience and openness.

The good side of this is that you will see broad new fields where innovation is needed, as well as very specific innovative ideas that are bursting to become companies. It's very exciting.

Ubiquity: So, many of the buzzword slogans we engage with may signal dark innovations that we do not see?

JM: That's right. Let me mention a crucial aspect of dark innovation: intent.

 ©2012 Association for Computing Machinery

Many dark innovations are produced by well-intentioned people, for a variety of reasons. It's a complicated topic with shades of gray and plenty of room for interpretation, so let's start with clear-cut bad intent.

In *Confessions of an Economic Hit Man,* John Perkins describes how he and his team used then-exotic econometric models to flummox foreign-government economists who might stand in the way of the huge projects Perkins and his team wanted to sell. They used intentional obfuscation—Perkins says they aimed to capture that nation's natural resources by getting them over their heads in debt on huge, uneconomic national construction projects.

A corollary to intended negative innovations are well-intentioned innovations that went awry. It's good to remember "Hanlon's Razor," which says we should "never attribute to malice that which is adequately explained by stupidity." This adage is a tonic to jumping to conclusions that people are evil or that they're part of massive conspiracies. Still, when picking up the pieces of a negative innovation, this adage can be hard to swallow.

The next big category is hubris, which comes in many interrelated flavors. A popular flavor of hubris is pushing a flawed mental model hard, as a matter of principle, without paying attention to the flaws.

For example, in 1921 an Italian general popularized the notion that bombing civilians in wartime will cause them to overthrow their despotic regimes. It's never proven true, but has been used over and over, leading to innumerable civilian deaths.

Many other strong political positions and military strategies are based on such flawed models. The purveyors of these innovations see their models as a very high form of innovation. Successful opinion shapers are powerful innovators.

Eddie Bernays was one of the founders of modern PR. He sold us orange juice and bacon for breakfast (separately), women smoking in public, and the 1939 New York World's Fair, among many other PR innovations. Read up on him. He was quite the innovator.

The global financial crisis that peaked in 2008 offers many lessons in dark innovation. To make them visible, let's separate the players into three groups: The inventors of the new instruments, the early buyers, and the late buyers. (I apologize for this oversimplification, but bear with me as I make my point.)

The inventors of collateralized debt obligations (CDOs) lie somewhere on a continuum of good and dark intent. The optimistic story is that they were well-intentioned financial innovators who either believed the innovative (yet flawed) probabilistic theories that made CDOs possible or failed to do sensitivity testing of their equations to see what would happen if housing prices

 ©2012 Association for Computing Machinery

stopped climbing at their usual rate (oops!). The pessimistic story is that smart designers of financial instruments saw other smart people buying into a few major fallacies and designed instruments that would generate extraordinary returns by taking advantage of the situation. The pessimistic view might be fraud, or maybe it's just a huge P.T. Barnum episode.

The next group, early buyers, was pushed by peer pressure into this new market. The securities were rated AAA; yet anyone who did the analysis would have discovered they were like the junk bonds of old. If you managed a big pool of money and were not investing in CDOs and later credit default swaps, you were likely to get fired. You had to climb on the carousel.

The third group is the late buyers, the ones who stayed on the carousel after word got around that many CDOs depended on lenders making so-called "NINJA loans": you could get a loan with no income, no job, and no assets. Why people stayed on the carousel for so long is beyond me: Any half-ethical, half-awake person could see that something rotten was going on.

Once housing prices dipped, even modestly, the entire construct was doomed. It fell apart. The resulting housing depression continues to plague us today.

The full story of the financial crisis is much richer than this, with many more dark innovations along the way, particularly a series of government actions that greased the rails for disaster. I don't have time to go into them here.

Ubiquity: Some dark innovations get established by people with good intentions, sometimes just pushing their intentions and other times following the movement of a crowd. Are there any other ways good intentions can cause problems?

JM: Yes, overconfidence and ignorance of unintended consequences. We are often so sure we understand how things work that we forge ahead with major interventions that we are sure will make things better. The book *Perfect Order: Recognizing Complexity in Bali* describes how science-based Green Revolution aid workers, believing they were increasing prosperity in Bali, almost wiped out the rice farmers of Bali as well as the reefs that surround the island. Pests overran the fields and the newly applied fertilizer drained off onto the reefs offshore, throwing off the ecological balances.

Maybe those should be labeled uninformed, unintended consequences.

 ©2012 Association for Computing Machinery

Ubiquity: What about good innovations that have a few negative side effects, such as opening up a large number of new jobs and shutting down a smaller number of existing jobs?

JM: These are hard to evaluate. Very often innovations cause market disruptions, which can lead to job losses and company closings. For example, Wikipedia has obsoleted Britannica's business and Craigslist has wreaked havoc on the classifieds business. In *The Innovator's Dilemma*, Clayton Christensen identified a natural market process that does this regularly. I don't think of losses that occur in the natural course of market evolution as dark.

We, all of us, need to be more aware of these forces and less willing to go along with dark innovations, even though the lines aren't always clear-cut.

Ubiquity: Is there any way to guard against the siren calls to dark innovations?

JM: Yes, sunlight and deep discourse are good ways to minimize dark innovations. These counteract the inclination to believe that you have all the answers by getting all the ideas, and their consequences, exposed and discussed. When you see people acting to shut down discourse, your alarm bells should ring. You should step in and demand deep, meaningful discourse that respectfully includes all the groups affected by a decision. This is how we can learn about the consequences of our actions and work together to make them work for all.

Efforts to shut down discourse, through propaganda and spin, by shouts of lack of patriotism, or even by coercion and violence, are particularly pernicious incubators of dark innovation. Powerful incumbents use these techniques to preserve their power, and, sometimes, smart insurgents use them to gain control.

If all this sounds too much like politics, consider that innovations in the end are changes to the workings and behaviors of social systems. The link between politics and innovation is very direct.

Ubiquity: I have co-authored a book about innovation (*The Innovator's Way*). We defined innovation as "adoption of new practice in a community." We saw examples of innovations that did not seem to have produced a positive benefit, and we wondered how they got adopted. We didn't want to define innovation as something necessarily "good." Other than a few examples, we did not study dark innovations. You have just given some examples of ways that dark innovations are introduced and adopted even if many people in the community are not interested.

 ©2012 Association for Computing Machinery

JM: That's right. Once you understand these dynamics, you'll see dark innovations everywhere, all the time. Incumbent companies (and governments) use them to shield themselves from disruptive innovators. If the incumbents are highly profitable, they can spend considerable money on technology, policy or other areas, tilting the field heavily in their favor. Remember that it's the executives' fiduciary responsibility to maximize profits only for their firm. The financial rewards for doing so have also shot through the roof.

About the Author

Peter J. Denning is the editor-in-chief of *Ubiquity* and a past president of ACM (1980-82). Currently he is a distinguished professor, chair of the Computer Science Department, and director of the Cebrowski Institute at the Naval Postgraduate School in Monterey, CA.

DOI: 10.1145/ 2160598.2160599

 ©2012 Association for Computing Machinery