

Ethics in Technology

by Dave Bolman

Part of the fun and responsibility of experiencing technology, especially with so much of it unfolding in front of us in a rather accelerated real-time fashion, is observing and thinking about how people respond to technologies that push the boundaries of past norms of right and wrong. This can be as humorously innocuous as walking around Las Vegas during a NetSec conference in a t-shirt that reads “Tech Ninja–Hack America” and catching looks of concern in the eyes of strangers that the wearer would perform some feat more damaging to the plastic in their wallet than would occur naturally in a city apparently built on the theme of a Disney-darkley. At other moments, questions of technology and ethics create sparks of thought and debate that probe a bit more deeply and reflect the kinds of concern that will populate and feed the media in upcoming years and decades.

Because of my role at a technology university, I often find myself chatting with small groups of people (parents, industry representatives, visiting scholars, students and the like) from diverse backgrounds who are in some way connected to technology. Once we wind past the initial questions of where everyone is from, how they got here and whether or not Arizona is really as hot as people say, I will cast into the group some interesting nugget related to technology that has been knocking around my brain that day. This often takes the form of something like “Did you hear that IBM has assembled nanotube transistors that can be used to create complex circuits that can in turn be used to make super-fast carbon molecule computers?” Oohs, aahs and mmms ensue.

Recently, after looking at harnesses designed to help the mobility of the elderly or disabled that looked like shiny white versions of the exoskeletal forklift used by Ripley to defeat an acid dripping alien queen, I mentioned how imminent the development of robotic personal aides and companions seemed to be. Robots as a useful and affordable tool appear to be coming inexorably close to hitting the mainstream. Products such as PaPeRo and iRobi Nanny possess the ability to recognize and interact with humans equally for entertainment and companionship and are designed to perform such household tasks as taking care of pets and notifying their owners via cell phone text and camera in case of some event occurring while away (Tae-gyu, 2006). The AI in these robots is increasingly capable of growing and developing as it spends time with a person and in a way is designed to develop a simple learned relationship in addition to helping to perform fundamental monitoring tasks. In my conversations, I point out that beyond butler-like utility tasks, some of the target applications for these robots are for young children and the elderly, particularly in situations where there is a shortage of humans who are able to fill the role. Reports from countries such as Japan and Korea talk of the lack of humans able to care for the elderly and toddlers and that these robots are being tailored to help fill the gap. At this point in the conversation, eyes widen as I emphasize that this is not a hypothetical use of technology, but is in fact something that is in active development right now, albeit at the very toe-hold of the curve. Invariably, the audience splits, with one group expressing a degree of awe and wonder at the idea that a scenario that up to recently lived pretty well within the confines of Asimov, Dick and the odd film (A.I. comes to mind) is becoming a reality before our eyes. A contrasting viewpoint also emerges that gives voice to a concern that at a very basic, human level, it is wrong to turn the care of our young and old over to machines. What follows is a very engaged dialogue that comes to mirror the patterns of optimism, advocacy, and concerns (a desire to go slow, for instance) that follows pretty much any new technology that changes the rules of our existence. Because this application of robots is still a bit removed for those of us living in the US, the conversation still feels like an abstract exercise. Yet, if you think about ideas such as digital privacy, genetic engineering, Internet-driven social networks and many others, you can get a feel for the rising pressure on humanity to gain a handle upon how we approach ethical dilemmas brought on by technologies that pose questions without prior answers.

So where do the ethical dilemmas related to technology begin? Probably right alongside the reason we innovate in the first place: We see a need, the tools at hand, the potential that they suggest, and then someone creates an innovation that bridges the two. However, because these creations often lead science (notions to the contrary are ill-proved by history; for an example, look no further than the Wright Brothers), some people, systems and environments are damaged. New technologies also turn long-established social rules into twisted, paradoxical knots, the reason being that new technologies often do not benefit from the understanding that comes from science or the wisdom that comes from prior social experiences. As a result, the creations brought about by technology often have messy implications as they rework the rules of life, society and our interactions with each other. In short, once a significant technology is introduced and fills a need or a desire, society will be engaged for years on what the rules are for its fair, moral and best use.

In other lifetimes, people had to deal with just one or two of these. This is not the case with our point in history. Consider this: The development rate of technology does seem to be in some way closely tied to how closely connected humans are to each other. This probably occurs because innovations are often the result of the cross-pollination of otherwise separated fields and the sharing of different perspectives by people with similar interests. Now that we exist a Google search away from linking the ideas of the vast populous who has access to the Internet, innovation is escalating into nooks and crannies like we have never before seen. If you don't believe me, try doing a search using the words "Mentos" and "Diet Coke." As you follow this search and watch Bellagio-like fountains of gas-propelled soda, pause for a moment to consider that this kind of exploding development and synthesis of ideas is occurring virally with just about any idea and innovation across a large swatch of the planet. For this reason, we are the generation that truly needs to get a handle on how to frame the ethical dimension of new technologies.

If we are going to talk about ethics in this age of technology, perhaps a good place to start is to look at what Wikipedia has to say about the topic. Using Wikipedia is in itself a source of ethical debate since this tool is in the thick of a heated conversation all its own regarding what constitutes effective knowledge resources. (If you'd like to experience the geek equivalent of a rugby match, lock a group of librarians in a room with millennial-age college students with a note on the table that asks: "Does Wikipedia represent the future of knowledge resources? Answer this and we will let you out.")

Wikipedia (at least at the time of this writing) defines ethics as:

Ethics (from the **Ancient Greek** "ethikos", meaning "arising from habit") is one of the major branches of **philosophy**, one that covers the **analysis** and employment of **concepts** such as **right**, **wrong**, **good**, **evil**, and **responsibility**. (Physis, 2006)

Having sorted out a basic definition, the next thing we need is to understand how it applies to the innovations that we create and release into the wild. Because the last few decades have handed humanity an abundance of new technologies unlike any other point in our history, it would be easy to think that the questions and debates (and headaches) associated with them are unique to our time. For whatever comfort it is worth, this not the case—our past is filled with earlier iterations of ourselves pondering the same kinds of questions, just rooted in times when new technologies came onto the human landscape a bit more discretely and at somewhat slower paces.

As a kid, one of my favorite cheesy shows to watch was The Wild Wild West, starring Robert Conrad. (For anyone who was exposed to the atrocity that was the Will Smith-Kevin Kline film adaptation, do what you can to wipe it from your perspective and if you haven't experienced the original, trust me that it was in its own way a pretty fun exercise in popcorn television.) The appeal of The Wild Wild West was in the juxtaposition of James Bond-style technology and spycraft in the age of Lincoln. A similar pleasure can be found in the animated Amazing Screw-On Head that is floating around The Cartoon Network. Admittedly, because of their imagery of steam-driven robots, these shows are a fair stretch from reality. What they do manage to nicely accomplish is helping to

get beyond thinking of the technologies in times past as quaint and non-controversial. Such is the perspective of living in our time when the issues related to technology developed prior to 1950 have pretty well been figured out. However, when we see steampunk imagery, we catch a glimpse of the kinds of questions and urgency that earlier eras faced when looking at something as amazing as railroads, printing presses, steam, dams and gunpowder.

Consider this tale as an example: Although we now think of awards in science and the advancement of humanity when we hear the word “Nobel,” as a culture we have forgotten that in his time, Alfred Nobel was the inventor of dynamite, smokeless blasting powder and blasting gelatine, the manufacture of which was so dangerous that factories tended to be located in impoverished areas because explosions and death were inevitable and only the very poor were willing to work in them. At the same time, these explosive inventions made possible many of the great civil engineering developments of the 19th century, such as the Transcontinental Railroad, Hoover Dam and the Suez Canal. At the same time, the creation of such explosives had a dramatic impact on warfare, with a noticeable rise in death rates coinciding with their introduction to the world’s militaries. In his time, Nobel became fabulously wealthy and his inventions were profoundly controversial, so much so that when a false news report of his death circulated in Europe in 1888, a French newspaper reported that the “merchant of death was dead” adding that “Dr. Alfred Nobel, who became rich by finding ways to kill more people faster than ever before, died yesterday.” In a real life event that mirrored a Dickensian tale, Nobel was so struck by this premature epitaph that he spent much of his remaining energies and fortune working to foster the advancement of peace and find a balance for the harm that his technology wrought (Greenberg, 2005). Looking back at this time, we can see that at no point did we as a society discard his creations—there was too much benefit—but what we did do over time was use experience to come to terms with usage.

Stories such as Nobel's are the rule rather than the exception. They explain how society's views on a technology evolve as we gain understanding and experience using them and seeing the implications that these tools bring. Consider the difference between 19th century and contemporary views over the balance of our growth as a nation weighed against the negative impact on Native Americans that resulted from a technologically driven westward expansion. Think about the different and nuanced perspective in how we view the use of nuclear power and weapons from our 21st century vantage point relative to what our parents and grandparents thought was ethical in the 1940s and 1950s.

As humans across history face challenging technologies, we use them based upon the needs and framework of the moment. This usually occurs with a bit of wonder and many unanswered questions about the implications for the future. Because we often have a need (or at least a desire) for whatever it is that we have created, humanity seldom sets a significant new technology aside because of unanswered questions of right or wrong. We remember the failure of scientists who developed atomic weapons to successfully petition the US government to not open that particular door. Across history, humans tend to dive in and respond once we have experienced the real implications of the new technology upon people, society, the environment and our moral codes. In some cases, we respond by changing our approaches. At other times, we amend our perspectives. Most often, our response is a bit of both.

Of course, one of the really tricky things about working with the ethics of significant new technologies is the reality that they do produce change but that it is profoundly difficult to predict where the bear traps actually lie. This is in part because what is created is often something completely new to the human experience. Take for example the case of computer gaming. Many have heard the concerns about exposure of people, especially minors, to games where ultra-violence and what would historically be called amoral acts are the source of entertainment. Although these are real concerns that need some sorting out, they are also just derivations of earlier conversations related to violence in film and television.

On the other hand, the emergence of broad social networking in an imagined virtual space for entertainment purposes is a completely new animal. The emergence of virtual worlds where people can spend time with other people via an imagined interface has become a reality through applications such as the online society of Second Life (a quarter of a million residents) and massively multiplayer online games (MMOs) such as World of Warcraft (six million players). In addition to a vibrant marketplace that allows residents to sell homemade items to fellow residents, Second Life hosts an active red-light district that begs the question of whether personal actions that are considered morally dubious in the physical world are acceptable in a synthetic one (Elliot, 2006). As people spend large amounts of time in alternate worlds, these constructs challenge notions of what are appropriate human interactions.

MMO's have a history of enacting real-world events such as weddings and funerals online. An in-game funeral procession in World of Warcraft in March 2006 raised the question of what exactly is appropriate behavior when the guildmates of a player who had died a few days earlier attempted to hold an in-game remembrance ceremony. Members of a rival guild and faction heard of the event, attacked the party mid-ceremony, made a film of the event and then distributed it on the Internet. The outcry and subsequent debate that followed centered on the question of the appropriateness of holding a funeral ceremony online, with one side pointing to the close bonds that the deceased held with online friends living across the globe, and the other side pointing out that World of Warcraft is a game and that holding real-life events in it are fundamentally inappropriate.

Another example taken from the MMO genre has the same roots in its ethical questions, but perhaps is a bit darker in its reality. Generally speaking, prostitution has clearly defined social and moral implications. The profession is old and the way we interact with it has generally been figured out. But what happens when it occurs in a virtual environment? This is the case with Second Life, where prostitution is not only part of the landscape, but has evolved to the point where an infrastructure of escort services and brothels exists, with an associated shadow economy. In game, three-dimensional avatars (which are often personalized) solicit and sell experiences that are intended to be more erotic and fantastically unconventional than can be experienced in the physical world. As reported by its participants, players on both sides of the virtual bed tend to be individuals who look to their Second Life experience as a way to explore new sexual dimensions without the ethical or health implications. To these users, there is not much of a boundary between a mental fantasy and a virtual one. Of course, there exists a counter-perspective that taking part in rather graphic, first-person sexual encounters in a virtual environment is at a minimum a terrible waste of time and in likelihood a morally distasteful pursuit (Urizenus, 2003).

What's unique about the present day is that this kind of question doesn't have one right answer. As we question what is right in these situations, we can't draw from the sage wisdom derived from the experience of our elders. This is new ground. What has emerged at this point is a recognition that we need to play some more and to talk about the implications for a time. Given rules of the past, both viewpoints are correct. Funerals are important social events that help grieving family and friends to honor the deceased and help to move on. Games are places where we entertain ourselves, where we have fun doing things that we would likely not do outside of the context of playing. The conundrum occurs because, as a culture, this thing—in which people build relationships and spend significant time in a world created and sold for purposes of entertainment—is new to us.

So what is a reasonable approach to new technologies that is at once thoughtful of the future and its unknown implications but which simultaneously allows new ideas to be brought forth? Looking at history, what worked and what didn't and what other observers of technology as a social force have said, let me suggest the following as a set of guidelines for the ethical development of technology:

1. Acknowledge that innovators are responsible for their creations.

2. Let challenging technologies develop incrementally over time.
3. Evaluate each new technology in its own right and within the context of the patterns that emerge around it.
4. Don't over-engineer the future, but instead plan for revisions based upon whatever emerges and is learned.
5. Allow disparate voices to emerge, and listen to all of them.
6. Evolve the technology and its use so that it serves the need that drove its creation and meets a broad social sense of what is good.

This first point—the recognition of responsibility—arises from a reality that those who innovate usually do so with the best and most optimistic of intentions. They are creating things for reasons of curiosity and the desire for innovation, as a way to extend our abilities, to fulfill a real need or simply out of sheer delight in the process of creation. In this way, innovators cannot claim to be like scientists, whose role it is to reveal the underlying workings of our universe. As was taught by the fictitious Dr. Hammond in Jurassic Park, because technology is used and has broad consequences innovators must carry a degree of ethical responsibility for the things that are created. This responsibility may seem heavy, but like those fictional dinosaurs and our not-so-fictional innovations, such as genetically engineered crops, livestock and, potentially, people, once a technology is made available it generally cannot be undone and often takes on a life of its own that goes beyond tight human control. As an example of this, track how genetically altered grain strains have “left the reservation” and become widely intermingled across the globe to a point where it is increasingly rare to find staple grains that do not have evidence of altered DNA. What will be the impact of this? It is hard to say until time has its say. Herein lies one of the great points in technology where the ethical rubber meets the road: How can innovators own the ethical outcome of their idea while avoiding a stifling barrier to creativity in the face of an unforeseeable future? An approach can be found by releasing new technologies decisively yet incrementally, and let time, discussion and informed revision create a socially viable solution.

A helpful image here might be this: remember all those jungle adventure movies that we have watched over the years? Depending on your generation, this could be King Kong, Allan Quatermain in King Solomon's Mine, Indiana Jones or Pirates of the Caribbean. At some point in any of these (you pick the era) our hero will find themselves needing to cross some insanely steep and perilous chasm using a dubious and untested rope. They have a need or desire to cross (usually in proportion to the quantity of spears being hurled in their direction) but the implications of their actions can't be predicted. One approach of course is to barrel ahead full tilt and see what happens. If the character is a red-shirt (as in the red-shirted crew members of the USS Enterprise who rarely survived the opening credits on Star Trek), the result usually involves being tenderized upon multiple rocks and then eaten by whatever lay at the bottom. Another approach, usually taken by the hero, is to take that first step upon a plank, see what happens, compensate and then take the next step. Lather, rinse and repeat until you reach the other side.

A historical example of this can be seen in the development of the automobile as a technological mainstay of our lives. As an innovator for the mass introduction of the automobile, Henry Ford could not have seen how all of the implications played out. What he did was introduce the world to the idea that was the Model T, a vehicle that was rock solid enough to do the basics and bring vehicles to the masses, but not so overreaching in capabilities that Ford was forced to answer the future questions of safety, energy and environmental impact that inevitably emerged. The initial cars raised some questions about noise, infrastructure and safety, but the implications were small enough to be managed in doses. Over time, as people began to push the development of the car, observations, conversations and implications gave rise to people like Preston Tucker, who made vehicle safety a design issue, and spurred the efforts of nearly all major automobile companies and the US Fuel Cell Council to answer the need for clean emission vehicles that are not reliant upon petrochemicals. It is unlikely that the original developers of automobile technology were thinking about topics such as safety or the energy implications of transforming how people get around.

These innovators, like those in almost any field, were interested in what it would take to make their idea a useful reality.

In all likelihood, Ford had his energies filled by working through the engineering of a rudimentary vehicle that could be produced for and used by the masses. A parallel to this idea is emerging in the field of software engineering. In the past, the general approach to development was to thoroughly engineer a product based upon the best information available and then catch bugs as a maintenance issue. This approach has been challenged of late by a different metaphor where initial tools are simple and perform their base functionality very well. This approach allows users to work in a set range and causes them to ask the questions about future features that the developer can address, consider and implement. In terms of ethical technological development, this perhaps is a mindset that allows innovators to address both perspectives.

The next way to develop a sense of relevant ethics is to treat the best use of a new technology on its own terms. We have to come to terms with the reality that, when facing something different enough to really challenge us, we have to be ready to release our mental images and expectations and be ready to think about the innovation in a new way. There is a hard thing in part because the human brain seeks out and righteously clings to the patterns that it has experienced as good. This is a trait that brain research suggests is essentially hard-wired into our being. The benefit of this is that we can think about new things and situations without being required to spend conscious brain cycles on routine matters. For example, there were many mornings that I spent the morning drive thinking about this article while some small part of my conscious happily auto-piloted me to the Extreme Bean so that I could get my coffee fix without overly disturbing my musings. The price we pay for this glorious benefit is that sometimes our patterning engages when we attempt to evaluate new ideas and, because they don't fit the norm, quietly pushes them into the "disregard" bin when they don't really fit. Take Wikipedia as an example of this: during a recent episode of The Colbert Report host Stephen Colbert exhorted viewers to edit the Wikipedia entry on elephants to read that there are the number of elephants in Africa had trebled within just a few months. Along these lines, The Onion recently ran a spoof with the headline "Wikipedia celebrates 750 years of American Independence, Founding Fathers, Patriots Mr. T Honored." These side jabs remind us that there are some pieces of information that are fairly concrete, verifiable and capable of being recited by well-versed school children pretty much at will. This of course is the strength of traditional reference tools such as the encyclopedia.

These spoofs also hint at our fears that somehow truth as we know it will be altered for the worse by people with an agenda or by ill-informed masses succumbing to urban legend and conventional wisdom. (Colbert terms this "truthiness.")

One of the challenges involving new technology is that we tend to evaluate it against what we have been doing up to this point. The trouble here is that the rules and patterns associated with how things are done now revolve around past situations (when the rules were set) and the nuances of the prior technology. The current debate regarding Wikipedia exemplifies this. The traditional encyclopedia was a technology developed in a time when people needed ready access to accurate information. Society didn't have an Internet with its wealth of information, and what was out there didn't change at the rate that we see now. The encyclopedia was created to answer the need for the fundamental canon on a subject that could exist in the homes of the masses. For all of the dialogue, jibes and concerns, Wikipedia is a new animal for a different time. It is a technology for a time when the social context and diverse viewpoints on a subject are highly valued and reflective of the complexity and nuances of our view of the universe. Is it as refined a technology as the trusty encyclopedia? No. Have all the questions been answered about how to balance collecting the wisdom of a great many perspectives with maintaining accuracy about reasonably established facts? Not yet. But when I woke up on August 25th, if I opened up my encyclopedia or its most recent DVD updates to the astronomical reference for Pluto, I would have seen it incorrectly described as a planet. Whereas, the same reference in an online wiki would have reflected its re-

designation as a dwarf-planet, along with a fairly rich discussion about the differing perspectives on the change in this astronomical body's status. These are valued features that go beyond what the refined, traditional encyclopedia can offer, and the value we place in this will drive the work on how to refine what we perceive are its weaknesses.

The idea of Wikipedia, with its ability to bring together many viewpoints on a subject, touches on another element in developing a new ethical context: the need to create time for parties with differing views to engage and express their values: especially with technologies that represent significant and new moral dilemmas. Think about how technology, such as the now ubiquitous digital camera, online databases of our most mundane activities and intelligent search engines that can derive patterns about individuals from disassociated text and image sources have rapidly changed the rules that made up our approaches to personal privacy. Add to this questions about whether governments and organizations should use this information for things like the tailoring marketing/product development to personal needs or preventing terrorist attacks. These technologies and uses of them are moving forward and are very much on the landscape of ethics today. One reason that we create new technologies is to make the human experience a better one and so it would seem to be counterproductive to use technologies in ways that are unhealthy or hurt the innocent or are fundamentally counter to our strivings to become better individuals. The conundrum, of course, is that as the rules we learned get altered by a new technology it is hard to see into the foggy haze of the future and predict what harm and unintended consequences will arise. For humans, learning requires experiencing a technology, communicating with each other what happened. As a part of our growing understanding of technology, we need to know that the results of our pushing the envelope will be both wondrous, unexpected and messy. This is very much the case with privacy. As digital information tools were released into the wild of humanity, they have given us remarkable new abilities in terms of accessing information (and using this to create). The reality that that our old protections of privacy would vanish was not really expected or anticipated. As we deal with ethical dilemmas and new technologies, we need to advance the topic enough so that people's thoughts, conversations engage and innovation has a bit of a catalyst to spur things forward. With privacy, the new rules, behaviors and laws that will shape the future will come mostly from people experiencing first hand what works, what doesn't and discovering what pieces of our old mental views on the topic have become irrelevant.

Using experiences and listening to the viewpoints concerned is a fair approach to controversial technologies and, to a degree, we can see it being played out in the realm of stem cell research: one of the great techno-ethical lightning rods of our time, with groups on both sides vocally at odds. A scan of the writings related to the notion of harvesting embryonic stem cells reinforces that our society has not yet achieved a resolved ethical perspective that meets the desires of people seeking advancements in health while also resolving about the nature of human life. Stepping back for a moment from personal viewpoints of "rightness" on the topic of stem cell research, consider how this topic has played out in the US over the past five years. In the late 1990s and into the early part of the millennia, scientists researching degenerative diseases began to see tremendous potential in the use of human embryonic stem cells because of their adaptability. The possibility of finding cures for spinal cord injuries, diabetes, Parkinson's disease, Lou Gehrig's disease and a host of others generated significant hope and advocacy in the minds of researchers and families with loved ones stricken by these kinds of ailments. Almost immediately, this enthusiasm was faced with equally heartfelt beliefs that the destruction of human embryonic cells in order to study the potential of finding these cures represented the crossing of a profound ethical line. Looking at our current rulebook of what is right and wrong provided no clear answers to this debate, in part because our culture has not yet achieved a comfortable consensus on where human life begins that matches our ability to track and interact with human development on an hour-by-hour basis. In the years since 2001, when President Bush blocked the use of Federal funds for US research into the field, the discussion has remained polarized and heatedly debated.

What is interesting here from an ethical and technological standpoint is that everyone engaged generally agrees that curing these diseases is something to be desired. Also, all sides seem to agree that the taking of human life in order to further research is wrong. These are well established social mores. The trouble lies in that sticky definition of when does human life begin, a debate that has swirled around medical technologies throughout the last century and is still without an agreed-upon answer. At its heart, this is an ethical debate brought about by technology, one that has sizable representation on both sides. One side advocates moving forward and chooses an ethical definition of where human life begins that supports their research desire while the other side stands as a cautionary roadblock saying that the ethics are self-serving. I would suggest that neither is profoundly right nor wrong at this point. Instead, this is a clash of unresolved desires, fears and beliefs, with great consequences and opportunities at play. The ethically right answer to the situation does not exist, otherwise the debate would not be so fierce. Yet it is absolutely imperative and healthy that the pressures that created the conundrum stay in place. Keeping our minds on the puzzle from all perspectives will over time lead to a solution that finds the “and” of opening the doors to curing ailments that diminish the lives of humans while meeting a broad test of the proper treatment of new human life. This concept of “seeking the and” offers an insight into how to deal with difficult technology situations. In short, it says that when faced with a set of bad options, do not choose one under a mindset of “lesser of two evils” or “one side is just wrong.” Instead, when faced with a highly polarized situation, dig deeper into the issue until you can find a desire or need that exists outside of the particulars of the application. Then, allow time for human inventiveness to work to find that yet undiscovered solution. This again echoes the notion that, when working with new and challenging technologies, the ethical solutions reveal themselves through the application of time, dialogue and the search for an answer that fits the conditions and wisdom of society as it sits at a moment in time. This may be the case with stem cell research, where this conflict of ethics and opportunity has lead researchers to pursue alternate techniques. In a relatively short time, some successes have been seen in developing colonies of human embryonic stem cells in ways that do not harm embryonic human life. Of course, such techniques will not immediately resolve the conflict—time, incremental practice and more conversation will be needed for a cultural comfort level to emerge. But such developments demonstrate how incremental practice mutes the conflict and moves us towards what will emerge in the future as an approach that bridges concerns and can ultimately become the ethical rulebook for future generations.

Of course, looking into the future can be a troubling thing. We have questions about the impact of profound new ideas. We know they will change us in one way or another and, in all likelihood, in many ways. At the same time, the future can't be divined from where we sit today. Instead, it will be experienced in its own time and will be shaped by the sequence of choices that we make. This is why being conscious of the ethical dimension in the future is so important to us at each moment of the now. If this conversation has done nothing else, it should trigger the beginnings of a realization that in the decades ahead we will work through many ethical questions of technology. Our generation will not be unique in this respect, but what we as individuals will face is perhaps more of these kinds of questions being raised at once than any of our forebears ever were required to answer. If our past is any guide to the future, we will mostly make good decisions, with a few bad ones along the way. As in the past, society will benefit (a little at first, but more and more over time) and along the way, some unforeseen and likely unforeseeable implications will cause pain, consternation and new puzzles for future generations to ponder. Hopefully we can be known as the first generation that was thoughtful about how we brought new technologies into the world, and we will be considered as having been able to work through the tough ethical questions. Perhaps then, our getting good at technology, so that it not only addresses some way that people wish to grow in our abilities but also teaches us to think about the ethical implications, is a reflection of our growth as humanity.

Personally, I find this to be source of more than a little optimism because, on average, history shows that people make pretty good decisions and that, over time, humanity does find its way

when presented with new ideas. As one example, the concerns and fears raised by MMO red-light districts and amorality of Grand Theft Auto are more than outweighed by developers like Davey Jackson of GarageGames who are committed to games that they be proud of. There is also the reality that Madden NFL 2007 sold more than 2 million units in its first few weeks, something that represents where the majority of game players spend their time.

Perhaps a metaphor and mindset for us with each new technology is something like experiencing childhood, adolescence and maturity all over again. We begin with curiosity and a desire to play. Then, we move into a teenage-like phase where we enthusiastically wield the new idea with excitement, advocacy, a bit of awkwardness and probably a bit more confidence than our experiences warrant. Over time, successes, setbacks and seeing the impact of the decisions that we make mature us and we settle into patterns of informed usage of this tool that will be refined until we move on to the next shiny red button of a technology and begin the process again.

If this direction of thought holds true, and running a quick mental check-list of significant technologies from dams to cars to electricity to atomic energy does seem to support it, then the answer to the question of how to behave ethically with the new tools that fill our thoughts with wonder (and a bit of trepidation) is simply to go forward, take decisive but incremental steps, engage in dialogue, listen, correct and ultimately give the process time to work itself out. If we do these things, we can look ahead at a technological future filled with robots, genetic engineering, profound connectedness and new forms of energy and be comforted without actually knowing what the answers and results will be. This is so that when all is said and done, we will figure out how to use our new toys in a way that is both very human and follows a pattern that we seem to understand at a rather DNA level. This is a good thing, because we humans are an innovative lot and in our hearts we want these circuits, constructs, images and networks that we imagine to make us better as people and cultures. After all, technology is among the greatest and most human aspects of our history and our identity as a species, so we should be good at it.

Citations:

Elliot, S. (2006). Escort mission. *Computer Gaming World*, 262, 34-36.

Greenberg, D. (2005). The man who changed his life after reading his obituary. Retrieved on September 7, 2006 from Chabad.org.

Physis (2006). Ethics. Retrieved September 11, 2006 from Wikipedia.

Tae-gyu, K. (2006). Mobile phones will control home robots. Retrieved September 8, 2006 from The Korea Times.

Urizenus (2003). Evangeline: Interview with a child cyber-prostitute in TSO. Retrieved on September 7, 2006 from The Second Life Herald.