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ABUNDANCE

The Future is Better Than You Think

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MAIN IDEA

When you examine all the hard facts, the science and engineering which are now in the pipeline, the only feasible conclusion one can reach is the world is on the cusp of major marketplace changes. Exponential increases in technology mean within the next two decades, the world (both developed and developing nations) will have the capacity to meet and exceed the basic needs of every man, woman and child on the planet. Abundance for all is literally within our grasp and a rising global living standard will result.

While this may run contrary to the gloom and doom which fills the daily news cycle, the undeniable fact is exponential gains are now being made in a wide and growing number of fields – artificial intelligence, robotics, computing, broadband networks, digital manufacturing, nanomaterials and synthetic biology to name just a few. As these and other technologies mature and get applied, it is inevitable society's most unsolvable problems will be addressed, especially when all of these advances amplify and build on each other.

"For the first time in history, our capabilities have begun to catch up to our ambitions. Humanity is now entering a period of radical transformation in which technology has the potential to significantly raise the basic standards of living for every man, woman, and child on the planet. Within a generation, we will be able to provide goods and services, once reserved for the wealthy few, to any and all who need them. Or desire them. Abundance for all is actually within our grasp."

– Peter Diamandis and Steven Kotler

1. How do you define abundance?

Abundance is best described as a three-tiered pyramid where first basic needs are met, then the person has access to the tools of growth and finally they live healthy and free lives where they can contribute to society. Abundance will be realized when everyone on the planet has unfettered access to all three tiers.

Abraham Maslow created what he termed his "hierarchy of human needs" in the 1950s and this working definition of abundance is loosely based on an adaptation of Maslow's concept. For an abundance pyramid:

- *The base of the pyramid*
  Global abundance would mean first of all everyone has sufficient water, food and shelter. Or to be specific:
  • Three to five liters of drinking water per day per person.
  • 2,000 calories or more of balanced, nutritious food daily.
  • Vitamin and mineral supplements as required.
  • 25 liters of water per person per day for bathing, cooking, etc.
  • Durable shelter with lighting, ventilation and sanitation.
- *The middle level of the pyramid*
  Once basic survival needs are met, people then want access to energy, education, information and communication tools. These dictate one's standard of living and provide the means for people to specialize in what they choose to do and then to be able to sell or exchange what they produce. Improvements for the people of the world in all of these areas would have huge benefits for society at large.
- *The peak of the pyramid*
  Abundance must be all-inclusive. Preserving and providing for the good health of the planet's population and the elimination of preventable deaths is an obvious and essential part of any definition of abundance. So too is freedom or political liberty – people being free to make choices and to act upon their own preferences.

So what is a reasonable time-frame for reaching these targets? Abundance is achievable within the next twenty-five years – by 2035. As "ambitious and far-fetched" as that may seem circa 2012, the simple dynamic is within the next decade significant and noticeable exponential changes will occur worldwide.

Few people believe global abundance will come about in their lifetimes. The reasons so few people believe in that possibility are numerous:

- Every day, you're deluged with news about pandemics, terrorists, regional conflicts and worse. That gives the impression worthwhile advances are completely out of reach and unrealistic.
- The news media has a bias towards negative news which sells better than good news. It's in their best interest to overemphasize the bad and therefore you believe "we're in a hole which is too deep to climb out of."
- The average person today is exposed to more new information in a week than a person in the seventeenth century encountered in a lifetime. It's hard to make sense of that much stuff – so you assume the worst.
- Generally speaking, society's pessimists get more air time that society's optimists. When people make predictions about famine and pestilence, you pay more attention than someone who suggests great things are about to happen.

The simple fact is today, less people are living in abject poverty and back-breaking destitution than at any time in the history of Earth. The number of people living on less than $1 a day has halved since the 1950s and today accounts for less than 18 percent of the world's population. Even better, that number is declining at an increasing rate. Political liberty and civil rights have increased substantially in the past decades with practices like slavery being outlawed. Social scientists also point out violence is decreasing as incomes rise.

Simply put humanity has covered a considerable stretch of ground over the last few hundred years but that growth will seem tame by comparison with what will be achieved in the next twenty-five years. Some great new tools and technology are nowo coming into play. The concept of global abundance isn't a mirage in the distance – it is something which is reasonable to achieve.

"A large proportion of our high standard of living today derives not just from our ability to more cheaply and productively manufacture the commodities of 1800 but from our ability to manufacture whole new types of commodities, some of which do a better job of meeting needs that we had back in 1800, and some of which meet needs that were unimagined back in 1800."

– J. Bradford DeLong, economist,
University of California at Berkeley,

"Despite the disparities today, we have seen two hundred years of enormous progress. That huge historical gap between the West and the rest is now closing. We have become an entirely new, converging world. And I see a clear trend into the future. With aid, trade, green technology, and peace, it's fully possible that everyone can make it to the healthy, wealthy corner."

– Hans Rosling, professor of international health,
Karolinska Institute (Sweden)

"History's littered with tales of once-rare resources made plentiful by innovation. The reason is pretty straightforward: scarcity is often contextual. Imagine a giant orange tree packed with fruit. If I pluck all the oranges from the lower branches, I am effectively out of accessible fruit. From my limited perspective, oranges are now scarce. But once someone invents a piece of technology called a ladder, I've suddenly got new reach. Problem solved. Technology is a resource-liberating mechanism. It can make the once scarce the now abundant. Take sunlight, for example. The amount of solar energy that hits our atmosphere is 174 petawatts (1.740 × 10^17 watts), plus or minus 3.5 percent. Since humanity currently consumes about 16 terawatts annually (going by 2008 numbers), there's over five thousand times more solar energy falling on the planet's surface than we use in a year. Once again, it's not an issue of scarcity, it's an issue of accessibility."

– Peter Diamandis and Steven Kotler

2. Exponential technologies now coming into play

It's hard for the human mind to comprehend the power of exponential technologies. The underlying driver of growth, however, is the fact at the present time, a number of technologies are enjoying exponential growth for a variety of reasons. All of that growth has the potential to change the world, especially when the cumulative impact of those advances are considered.

In 1990, the US Department of Energy and the National Institutes of Health launched the Human Genome Project. It was forecast it would take fifteen years and more than $10 billion to sequence the human genome. Ten years later, Craig Venter decided to get into the race and established a company called Celera. By building on the work which had been done by that stage, Vetner was able to deliver a fully sequenced human genome in less than a year for just under $100 million (while the government ended up spending $1.5 billion.) This illustrates the fact when exponential changes occur – like that which has happened with raw computing power – it's difficult to forecast just how quickly significant change can come about.

Increases in computing power is the not the only field in which exponential changes are occurring. Other fields which are enjoying exponential growth also include:

- *Bioengineering*
  The search is on today for algae-based fuels which can replace petroleum with fuel that is ultra-low-cost and environmentally friendly. Bioengineering has also meant food crops that are fifty times more productive, vaccines that can be made in twenty-four hours rather than months and other natural process enhancement technologies.
- *Networks and sensors*
  While the Internet has created what is in effect a global data field, it's still early days yet. In the very near future, trillions of devices will be connected in. That will enable companies to match production with demand with decimal point precision and for devices to be operated in such energy efficient ways the savings in energy use will be world changing. The world will be awash with so much real-time information almost every industry imaginable will be reinvented.
- *Artificial intelligence*
  For all its false starts and hyped promises, artificial intelligence is steadily gathering momentum and operational capabilities. This will soon lead to anti-collision sensors for motor vehicles which will not only save lives but also substantially reduce the world's $230 billion annual accident costs – around 2 to 3 percent of the world's GDP. AI will revolutionize the way children are taught in the future, the way patients are diagnosed and the way energy gets used.
- *Robotics*
  Within a few short years, personal robots will take over the care of the young and the elderly, the productivity of factories and many other time intensive tasks. As these efficiencies work their way through the economy, the global economy will grow by orders of magnitude and many important challenges which are now facing different nations will be addressed. The possibilities which open up when everything imaginable is automated are hard to comprehend.
- *Digital manufacturing and infinite computing*
  3-D printers are now available which build physical objects by laying down successive layers of materials such as plastic, glass, steel, titanium, etc. Today 3-D printers are being used to make everything from lamp shades to customized prosthetic limbs. Hobbyists are making their own robots, biotech firms are experimenting with the 3-D printing of replacement organs and astronauts print the spare parts they need to make repairs. When 3-D printing combines with ongoing exponential increases in computer processing power, impressive possibilities open up. In the future, instead of waiting for a retailer to send you something you purchase by FedEx, you may be able to hit print and make it within minutes. Digital manufacturing and cloud computing will be revolutionary in their impact because they will be accessible by all.
- *Medicine*
  Lab-on-a-Chip technologies now under development mean a person can place a drop of blood on a device sensor and immediately be screened for a huge database of diseases. This kind of diagnosis will be accurate, low-cost, easy-to-use and quick – perfect for the sixty percent of the world's population which currently lives beyond the reach of urban hospitals and medical infrastructures. Medicine will move from being reactive and generic to more of a predictive and personalized delivery model. And the possibilities when AI is added in become even more interesting.
- *Nanomaterials and nanotechnology*
  Nanotechnology involves building things one atom at a time. Nanoscience will result in materials (nanocomposites) which are stronger than steel for a fraction of the cost. Nanomolecules will boost the power efficiency of all kinds of devices and be used in everything from superconductors to drug delivery systems. Not only will nanotechnology bring accelerated development to human performance but it will also have a starring role to play in advances which will come in materials, water, energy and food.

What all this means is as impressive as the pace of technological change in the world has been thus far, we haven't seen anything yet. When all of these technologies which are growing at exponential rates get combined, greater progress will be made in the future than ever before. The current rate of technological progress is moving more than fast enough to solve the challenge of creating abundance for all.

"I now have a very simple metric I use: are you working on something that can change the world? Yes or no? The answer for 99.99999 percent of people is 'no.' I think we need to be training people on how to change the world. Obviously, technologies are the way to do that. That's what we've seen in the past; that's what drives all the change."

– Larry Page, cofounder, Google

"Ultimately, though, the most exciting development will be when infinite computing is coupled with 3-D printing. This revolutionary combination thoroughly democratizes design and manufacturing. Suddenly an invention developed in China can be perfected in India, then printed and utilized in Brazil on the same day—giving the developing world a poverty-fighting mechanism unlike anything yet seen. "

– Peter Diamandis and Steven Kotler

3. Building the base of the pyramid

To build the bottom layer of the pyramid and bring food, water and shelter to all, those exponential technologies are going to need a bit of help. Fortunately, there are already forces already at play which will accelerate the impact of those exponentials. In the next two- to three-decades, these three forces will combine and collaborate to speed up progress on building the base of the abundance pyramid:

1. The do-it-yourself innovators
2. The arrival of a new breed of technophilanthropists
3. The combined power of the one billion emerging consumers

One of the great features of biological systems is individual entities can work together toward a greater cause. This is certainly true for the human race where cultural evolution occurs on a regular basis along these lines:

In this way, a self-perpetuating positive feedback cycle starts and grows. This kind of feedback cycle is now starting to come to bear on the challenge of providing everyone on the planet with enough food, water and shelter. Some very smart people are turning their attention to this and they have two of the most powerful tools of collaboration and cooperation at their disposal:

1. *Modern transportation capabilities* – which makes it feasible for physical items to be delivered anywhere in the world cost effectively.
2. *Information and communication technology* – like cell phones and the Internet which makes it possible for mental resources from all over the world to get organized and synchronized.

Both of these tools are potential game changers in and of themselves because they give individuals the ability to understand global issues and then do something practical about them. When you have information-sharing devices which are portable, affordable and hooked up to the Internet, pretty impressive things can come about.

Take the challenge of getting drinkable water to everyone, for example. Around 97.3 percent of the water on the planet is too salty to drink and another 2.0 percent is locked up as polar ice leaving just 0.5 percent for human consumption, agriculture, industrial uses, etc. Self-taught physicist Dean Kamen, founder of DEKA Research and Development, has developed a machine the size of a dorm-room refrigerator which allows you to stick the inlet hose into anything wet – salt water, waste water, even latrines – and the machine can generate 1,000 liters (250 gallons) of completely sterilized drinking water a day. What's even more impressive is this machine, called the Slingshot, can do that using the same amount of energy as a hair dryer. In field trials in Bangladesh, a Slingshot was run for 6 months by burning camel dung and in addition to generating fresh drinking water, the machine also provided villagers with enough electricity to charge their cell phones and power their lights.

Admittedly the Slingshot still costs $100,000 each but with volume production, the cost per unit will come down to $5,000. The Slingshot is designed to work for at least five years without any maintenance so that means the cost of producing one thousand liters of drinking water per day is $0.0002 per liter. Allowing for interest and labor, that will work out to four cents for five liters of drinking water.

As promising as the Slingshot sounds, it will only be one part of making water universally available. Engineer Michael Pritchard has developed the Lifesaver bottle which incorporates a microfilter. A family-sized version produces 25,000 liters of water for half-a-cent per day. For total capital expenditure of $20 billion, everyone on the planet can have access to safe drinking water – and many more nanotechnology devices and filters are on the way which will work even better and even cheaper.

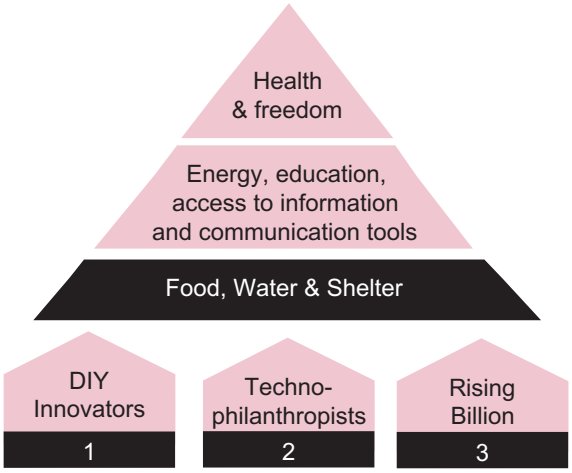
Impressive advances are also being made in meeting the challenge of feeding the world's population. Traditional farming and food production methodologies have used pretty much a "brute force" approach which is clearly unrealistic for developing nations. Genetically engineered crops have resulted in an eighty-seven fold increase in productivity and have revolutionized food production but distribution still remains a challenge. The fact is despite living on a planet which produces more than enough food for everyone, there are nearly one billion people who currently go hungry. Several innovative solutions to this dilemma are under development:

- Hydroponics – growing food in water rather than soil – is 70 percent more efficient than traditional soil-based agriculture but to date has only been used in small niche applications like growing pot or recreational drugs. In 1983, NASA researchers trying to figure out how to feed astronauts on Mars came up with aeroponics – suspending plants in midair and delivering food to them through a nutrient-rich spray. Aeroponics is 70 percent more efficient than hydroponics. Furthermore, since traditional agriculture uses 70 percent of the water on the planet, if aeroponics were to be widely adopted, agricultural water use would drop to 6 percent.
- One of the major costs of food is transportation. With that in mind, vertical farms are being developed which can be located in buildings in major cities. A thirty-story vertical farm, one square New York block in footprint, could grow enough food on site to feed fifty thousand people a year. One hundred and fifty vertical farms could feed everyone in New York City without the use of pesticides and with no fossil fuels being used for planting, harvesting and delivery.

- Even with ultra-efficient farms, humans still need 10- to 20-percent of their diet to be protein. Cattle and chickens are a highly inefficient way to produce that. Aquaculture (fish farming) is one promising alternative which is renewable and scalable. The other alternative here is cultured meat or in-vitro meat – where meat is grown from stem cells in giant tanks known as bioreactors. NASA again pioneered the cultured meat process in its quest to find ways to feed astronauts on long space flights. Admittedly all of these technologies have problems and issues which must be addressed before they get to prime time use but they all have the potential to feed the world in more efficient and therefore more sustainable ways.

It will probably take around ten to fifteen years for these feed-the-world technologies to penetrate deep into the world's food crop markets. In the meantime, genetically engineered crops of cotton, corn and soybean will continue to increase. Farmers will figure out better ways to deal with crop loss caused by pestilence by becoming more familiar with push-pull interlocking systems – where plants which deter insects are planted between rows of cash crops like corn and soybean. All of these developments will improve the planet's primary productivity and make it feasible to feed the world.

As promising as all these new food, water and shelter technologies sound, there are three other forces of abundance which have come along in recent years which will combine to accelerate progress in all these areas:



- *Accelerator #1 – The new breed of do-it-yourself innovators*
  Many people today are combining the tools of the information age with their own self-reliance to do impressive things. In many ways, the quality of the tools which are freely available have now caught up with the scope of the idealist's vision. Small groups are getting together (either in person or via the Internet) to pull things off which in previous eras would have required the resources of large corporations or even the government of a nation. Small private companies and talented individuals are now flying into space, building automated drones and developing synthetic biology capabilities which are truly impressive. Social entrepreneurs are banding together to provide finance for third-world businesses and to invest in purpose-driven causes. Never before in history have ordinary people had the ability to achieve so much and many DIY innovators are now applying their skills and talents to the challenges of feeding the world.

- *Accelerator #2 – The new breed of technophilanthropists*
  When Bill Gates, one of the world's richest men, left Microsoft, he established a foundation and started working to bring more vaccines to children and others around the world. Rather than waiting for the World Health Organization to get onboard, Gates pledged $10 billion of his own money, built a team and started getting people on the ground where it counted the most. Even better than the fact he could write checks to fund everything himself, having Gates involved also opened lots of doors that ordinarily would have been shut. Gates is just one of the new breed of hard chargers who typically earned their fortunes at young ages in technology ventures and have now decided to try and make a difference. In 2010 alone, Bill Gates teamed up with legendary investor Warren Buffett and got sixty-nine billionaires to pledge they would give away at least half of their fortunes to charities before their deaths. Those to have signed up include George Soros, Ted Turner, David Rockefeller, Larry Ellison, Paul Allen, Steve Case, Pierre Omidyar and Mark Zuckerberg. These are smart people who have amazing resources behind them and they are now focusing on solving the biggest problems facing humanity in the immediate future.

- *Accelerator #3 – The rising billion*
  The world's biggest untapped market is the four billion people who occupy the lowest strata of the economic pyramid. The so-called bottom billion are now becoming a viable economic market for the first time in history because this is a niche that has extraordinary aggregated purchasing power. Finding ways to collaborate with this market in development activities which pull the poor out of poverty is an awe inspiring market opportunity. As the bottom billion get access to products and services which are now only available in established mature markets, they will become the rising billion. There will be such large advances in their combined purchasing power they will have the power to dramatically reshape the world. As smartphones – which have the processing power of the personal computers of just a few years ago – become available at an affordable price to the bottom billion, there will be a huge influx of fresh ideas which will have the ability to trickle up. It's not at all unreasonable to conclude the imminent arrival of the bottom billion may yet turn out to be the saving grace of the entire plant.

"As some of the smartest people look at where to focus their energies next, they are now attracted to the biggest problems facing humanity, particularly in areas such as education, health care, and sustainable energy. Without suggesting complacency, I believe it is very likely that they will solve the many challenges in those areas, and the result will be the creation of new technologies, companies, and jobs that will bring prosperity to billions on Earth."

– Elon Musk, cofounder PayPal

"Never before in history has the global marketplace touched so many consumers and provided access to so many producers. The opportunities for collaborative thinking are also growing exponentially, and since progress is cumulative, the resulting innovations are going to grow exponentially as well. For the first time ever, the rising billion will have the remarkable power to identify, solve, and implement their own abundance solutions. And thanks to the net, those solutions aren't going to stay balkanized in the developing world."

– Peter Diamandis and Steven Kotler

4. The peak of the pyramid

Once everyone has enough water, food and shelter, then further progress is defined and driven by their access to energy, education and healthcare. Abundance has to be all-inclusive to be sustainable. Once people have those resources, they then start working on increasing their personal freedoms. Freedom is the direct beneficiary of progress.

The world of abundance will need lots of energy, freely available education so people can build their prosperity and universally available healthcare. Once that middle layer of the pyramid has been addressed, people will then want the freedom to pursue their dreams. Significant advancements are on the way in all of these areas:

1. *Energy* – The fact the developing world does not have a legacy infrastructure of centralized power plants may yet turn out to be a blessing in disguise. This will allow them to skip the large-scale coal and petroleum power plants of the industrialized nations and instead go straight to decentralized, renewable-power generation architectures. Many of these countries have vast deserts which are perfect for solar power generation and the price of photovoltaic cells (which convert sunlight to electricity) is steadily declining while at the same time efficiency is soaring. Wind power technology is also getting better and at present is approaching the cost of coal generated electricity. Synthetic fuels are approaching mass market availability and battery technology for the storage of baseload electricity is also enjoying substantial gains. A company called TerraPower is also developing self-contained small-scale nuclear reactors which are sealed plug-in units big enough to power entire cities. All of these energy sources can then be complemented by intelligent power grids which will be orders of magnitude more efficient than the power distribution systems which currently exist in developed nations. It's not unrealistic to forecast that as all these different technologies gain widespread application, the world could literally be awash in cheap, abundant and planet-friendly energy within the next decade. This has the potential to drive economic growth rates worldwide through the roof as the cost of energy is a major input into many value chains at the current time. If prices will just keep falling at their current rate and capacity keeps growing at its current rate, 100 percent of the world's energy needs will be met by solar power alone in eighteen years. When all of the other energy advances are added in, that ideal of making affordable energy available to all becomes achievable much, much sooner.
2. *Education* – The long-term benefits of more education are obvious. What's changing, however, is the traditional model of a fixed educational system is becoming obsolete. In its place are initiatives like One Laptop Per Child – which as its name suggests is attempting to provide every child on the planet with a rugged, low-cost, low-power laptop which is connected to the Internet. The initial goal was to make this available at a $100 price tag and thus far it has got to roughly $180. Once children have the tools, they can then join self-organized learning environments where they can learn on their own or with tutors using Skype. There is a vast and growing reservoir of educational materials available online in a wide variety of formats including games that teach in an engaging manner. The Khan Academy, for example, has more than 2,200 ten to fifteen minute videos available for free which teach everything from molecular biology to history to quadratic equations. There are already two million students a month who are using this educational resource to learn at their own pace. And not to be left behind, the educational system is evolving to make learning more personalized and more applicable to the needs of future employers.

"With the convergence of infinite computing, artificial intelligence, ubiquitous broadband coverage, and low-cost tablets, we can provide a nearly free and personalized education to anyone, anywhere, at any time. This is an incredible force for abundance. Imagine billions of newly invigorated minds, thrilled by the voyage of discovery, using their newly gained knowledge and skills to improve their lives."

– Peter Diamandis and Steven Kotler

3. *Healthcare* – People won't feel prosperous until they have ready access to affordable, high-quality healthcare in their own neighborhoods. As the number of doctors graduating worldwide is declining, this won't necessarily require setting up local neighborhood doctors worldwide. It's more likely technology will become available which will allow everyone to become CEO of their own health care services company. Miniature devices will become widely available which will allow you to take a drop of blood, a drop of urine or a sample of spit and immediately screen yourself for a wide range of health issues. What once required a long visit to a doctor, a vial of blood and days or weeks of waiting will be able to be performed in your own home with just a drop of blood and a fifteen-minute wait – all for less than $1. Zero-cost diagnostics will be revolutionary but so too will be the surgical robots which are now under development. These specialized machines will perform simple and repeatable surgeries (like cataract operations) with unerring accuracy. If any difficulties arise, a surgeon can assist from a remote location using telemedicine. Surgical robots are already used today worldwide to assist orthopedists with knee replacements and other delicate procedures. Robotic nurses can then take over the post operative recovery process. These robotic nurses will also be able to assist the elderly to live alone, to provide palliative care for those who are in the last stages of cancer and to augment the delivery of healthcare services anywhere in the world. Furthermore, stem cell research is advancing at an impressive rate. This has the potential to completely revolutionize health care in the future if, as forecast, it becomes possible to inject stem cells into patients in order to treat and potentially cure diseases. Health care is entering a period of explosive transformations which will lift the standard of health for people in every country of the world.

"As the baby boomers age, there is no amount of money that the richest among them won't spend for a little more quality time with their loved ones. Thus, every new technology inevitably finds its way into the service of health, driven by an older, wealthier, and more motivated population. In the same way that Wall Street tycoons talking on briefcase-sized mobile phones in the 1970s underwrote the development of the hundreds of millions of Nokia handsets now scattered through sub-Saharan Africa, so too will the billions of health care research dollars and entrepreneurial inventions described in this chapter soon benefit all nine billion of us. And given the rigorous, somewhat calcified, nature of the first-world health care regulatory process, there's every reason to believe that more than a few of these groundbreaking technologies will first make their way to less bureaucratic regions of the developing world before being legally allowed onto Main Street, USA."

– Peter Diamandis and Steven Kotler

4. *Freedom* – While freedom clearly means different things to different people, the technologies which underpin abundance will logically result in greater personal economic freedom, an expansion of human rights, increased political liberty and the transparency and the empowerment of the individual which comes with free speech. All of these freedoms are important but it is the empowerment of the individual that will be far reaching. Using information and communications technology and especially Internet-delivered tools like Facebook, Bluetooth and Twitter, individuals have recently been able to organize rallies which have drawn millions of people into protests which have even bought about changes in government in the case of the Arab Spring. The recent A Million Voices protests which saw more than twelve million people taking to the streets in protest in Columbia was another thought provoking example. When the Revolutionary Armed Force of Columbia saw how many people were against their insurgency, they gave up the fight and released all their hostages. Modern information and communication technologies are great tools for self-improvement and self-empowerment.

"So while information and communications technology (ICT) is clearly the greatest tool for self-empowerment we've yet seen, it's still only a tool, and, like all tools, is fundamentally neutral. A hammer can build bridges or bash brains. Connection technologies are not much different. While their bias toward self-empowerment is clear, there's no guarantee that a safer, freer world will be the result. What ICT does guarantee is an exceptionally broad platform for cooperation. Nations can partner with corporations, which can partner with citizens, who can partner with one another to use these tools to promote positive self-empowerment, democracy, equality, and human rights. In fact, with the complexity of today's world, this sort of cooperation appears to be mandatory. As Schmidt and Cohen point out, "In a new age of shared power, no one can make progress alone." But we can all make progress together—which is, after all, the point."

– Peter Diamandis and Steven Kotler

"What's within our scope are economic freedom, human rights, political liberty, transparency, the free flow of information, freedom of speech, and, empowerment of the individual. These are all categories impacted directly by the forces of change discussed, all liberties liberated on the road to abundance."

– Peter Diamandis and Steven Kotler

5. Steering towards a faster course of action

One of the best ways to move progress towards abundance forward faster is to run some incentive competitions which will reward those who get there first. This is a device which has worked to stimulate mankind's progress in the past and incentives have a solid track record. To bring about abundance, society needs to set more bold targets and then reward those who get there first with the solutions that will be required.

Incentive competitions have been used on numerous occasions to achieve impressive feats. A few examples:

- Charles Lindbergh flew from New York to Paris in order to win the $25,000 Ortieg Prize. Lindbergh's achievement set the foundation for what has become the multi-billion-dollar commercial aviation industry.
- In 1714, the British parliament offered twenty-thousand-pounds to the first person who figured out how to accurately measure longitude at sea. This prize was ultimately claimed by a self-educated clockmaker John Harrison who invented what became the marine chronometer.
- In 1795, Napoleon offered six-thousand-francs as a prize to whoever could come up with a food preservation technique he could use to feed his army as they marched to Russia. The winner, Nicholas Appert, established the basic methods of canning food still used today.

The great thing about incentive competitions is they attract interest and activities from people who are outside established areas of specialization. For example, when Burt Rutan won the $10 million prize for space flight by a private company, another half-dozen companies had formed to compete and those companies had attracted around $1 billion in investment capital. Incentive competitions work because they get people's imaginations fired up.

"If you need to accelerate change in specific areas, especially when the goals are clear and measurable, incentive competitions have a biological advantage. Humans are wired to compete. We're wired to hit hard targets. Incentive prizes are a proven way to entice the smartest people in the world, no matter where they live or where they're employed, to work on your particular problem. As Raymond Ortieg discovered in the early portion of the last century, such competitions can change the world."

– Peter Diamandis and Steven Kotler

"Prizes can be the spur that produces a revolutionary solution. For centuries, they were a core instrument of sovereigns, royal societies and private benefactors alike who sought to solve pressing societal problems and idiosyncratic technical challenges."

– McKinsey & Co.

The other great thing about incentive prizes is they often attract the efforts of small groups of people working together. History has shown small groups of people from diverse backgrounds are better at coming up with breakthroughs than even the large and well resourced government or corporate groups. Incentive prizes are perfect for tapping into the energy and creativity which abounds in small groups.

While incentive prizes are not a universal panacea, they can be a useful way to fill in the gaps on the road to abundance. Incentive prizes work well because they require a clear and well stated target to be achieved within a specified timeframe and subject to constraints which match real-world conditions. Imagine the creativity which would be unleashed if a government were to offer a $1 billion prize to the first team to develop a cure or vaccine for AIDS or cancer – with the prize to be paid to the scientists involved in making the discovery rather than a corporate entity. You would create an army of brilliant people working on the problem on their own dime. That same thing can happen with any of the problems which stand on the path to abundance for all.

"In the beginning, people tell you that's a crazy idea, and it'll never work. Next, people say your idea might work, but it's not worth doing. Finally, eventually, people say, I told you that it was a great idea all along!"

– Sir Arthur S. Clarke, inventor of geostationary communication satellites and science fiction author

"Revolutionary ideas come from nonsense. If an idea is truly a breakthrough, then the day before it was discovered, it must have been considered crazy or nonsense or both—otherwise it wouldn't be a breakthrough."

– Burt Rutan

Changing the world for the better and finding practical and workable ways to end famine, raise everyone's living standards right across the globe and integrate everyone into the online world are crazy notions that most sane people will believe cannot be done. The reality is to change the world, you have to be a little bit crazy and a little bit unconventional. You can't rely on the opinions of "experts" because these people have spent their entire careers learning the status quo. It's next to impossible for them to then turn around and state everything they know is wrong and a waste of time.

NASA's Apollo program to land a man on the moon and return him safely to Earth in the 1960s was driven by engineers in their mid- to late-twenties who were prepared to take risks and follow their hunches. Similarly, the dot-com boom of the 1990s was driven by a group of twenty-somethings who were driving a revolution. This is not a coincidence – youth always has and always will drive breakthrough innovation. Along the path, there will inevitably be some short-term failures and mixups. Failure is the price of learning and always teaches important lessons about what and will work in the real world if you pay attention. The key to moving forward is to keep trying even when initial efforts don't go as planned.

The whole object of creating a world filled with abundance for all is it will open up possibilities that can only exist when constraints are lifted. Studies have shown at the present time, the freedom to flourish in the United States was only realized once a person earned more than $75,000 a year in 2008 dollars. Below that level of income, the majority gets spent on necessities like water, food, clothing, housing, health care and education. Once American's earn more than $75,000, they have discretionary income which can be applied to projects of their own choice.

Globally, the annual income figure at which basic needs have been met is around $10,000. If every person on the planet were to earn that much, there would be a major boost in the quality of life for everyone. What's interesting about that figure is twenty years ago, when someone became well off they would typically buy some assets that would enhance the quality of their lives – like stereos, cameras, entertainment systems, a set of encyclopedias and so on. Today, all of those come standard on a smart phone which costs a fraction of that $10,000 figure – and anything that's not included in the price can be purchased as an app for less than the cost of a cup of coffee. That's the power of abundance at work.

"We don't have to wait for history to help our cause, we can help it ourselves. We have our hard targets for abundance, we know which technologies need further development, and—if we can improve our appetite for risk and utilize the leverage of incentive prizes—we know how to go from A to B much faster than ever before. Unlike earlier eras, we don't have to wait for corporations to get interested in solutions, or for governments to get around to our problems. We can take matters into our own hands. Today's technophilanthropist crowd seems determined to provide the necessary seed capital (and often much more than that), and today's DIY innovators have proven themselves more than capable of getting the job done. Meanwhile, the one-quarter of humanity that has forever been on the sidelines—the rising billion—has finally gotten into the game. Most importantly, the game itself is no longer zero-sum. For the first time in forever, we don't need to figure out how to divide our pie into more slices, because we now know how to bake more pies. Everyone can win."

– Peter Diamandis and Steven Kotler

"In today's hyperlinked world, solving problems anywhere, solves problems everywhere. Moreover, the greatest tool we have for tackling our grand challenges is the human mind. The information and communications revolution now underway is rapidly spreading across the planet. Over the next eight years, three billion new individuals will be coming online, joining the global conversation, and contributing to the global economy. Their ideas—ideas we've never before had access to—will result in new discoveries, products, and inventions that will benefit us all."

– Peter Diamandis and Steven Kotler

"Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has."

– Margaret Mead, American anthropologist

"None of our men are 'experts.' We have most unfortunately found it necessary to get rid of a man as soon as he thinks himself an expert because no one ever considers himself expert if he really knows his job … Thinking always ahead, thinking always of trying to do more, brings a state of mind in which nothing is impossible."

– Henry Ford, founder, Ford Motor Company

"Proverbs 29:18 tells us: "Where there is no vision, the people will perish." Perhaps that's true, but it's also myopic. Abundance is both a plan and a perspective. This second bit is key. One of the more important points is that our perspective shapes our reality. The best way to predict the future is to create it yourself. So while the Bible offers a warning, it's helpful to remember that the inverse is also true: where there is vision, the people flourish. The impossible becomes the possible. And abundance for all becomes imagine what's next."

– Peter Diamandis and Steven Kotler