



Titans Briefs

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Today's Titans Brief is attached for your convenience. It is written by Walker Ryan (walkerryan12@gmail.com)

Book: *Abundance: The Future Is Better Than You Think*

Author: Peter H. Diamandis & Steven Kotler

Length: 6 pages

Sponsors: Rob Arnott, Sylvia Bell, Bernie Bozzelli, Tom Meurer

Summary:

Abundance: The Future Is Better Than You Think is an exploration of leading global problems, and the energy, money, and time focused on prescribing solutions. Diamandis and Kotler lead the reader through the past, present, and future of an age-old topic: abundance.

Abundance: The Future Is Better Than You Think was born out of the discussion between two entrepreneurs. Peter H. Diamandis, a scientist and an entrepreneur, is most widely known for his creation of the XPRIZE Foundation, a non-profit organization tasked with encouraging technological innovation benefitting mankind, and Singularity University, a multifaceted University established to “educate, inspire and empower leaders to apply exponential technologies to address humanity’s grand challenges.” Steven Kotler is a journalist and entrepreneur. The two met after Kotler wrote a piece about XPRIZE, a competition initiative orchestrated by Diamandis “to encourage technological development that could benefit mankind.” Diamandis enjoyed Kotler’s writing style, and posed the idea of collaboration on the topic of abundance, “a world of nine billion people with access to clean water, nutritious food, affordable housing, personalized education, top-tier medical care, and non-polluting, ubiquitous energy.”

Through *Abundance*, Diamandis and Kotler contend that technological innovation has solved, and will continue to solve, many of the world’s most debilitating problems at an ever-increasing rate. Throughout the novel, the authors express their optimism for the future. They share tales of technological breakthroughs, which act as catalysts for abundance.

The book begins with a formation of perspective, the way in which resources and their availability play an integral role in society. Diamandis and Kotler shape the idea of abundance and how it is an age-old phenomenon. Next, the topic of “exponential technologies”, including networks and sensors, artificial intelligence, robotics, digital manufacturing, medicine, and nanotechnology, establishes optimism for the world’s future. On top of this, the authors discuss “building the pyramid” of abundance through competitions and initiatives for entrepreneurs and their counterparts. The forces of abundance are revealed through these competitions, alleviating skepticism about solutions to some of the world’s challenges. Further, Diamandis and Kotler explain the types of thinkers who will build the abundance pyramid. The book ends with a note from the author’s compelling action as an alternative to passivity in the face of the world’s challenges.



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ABUNDANCE

THE FUTURE IS BETTER THAN YOU THINK

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The Art of Perspective

Diamandis and Kotler provide a new framework through which to view abundance. For some time, the global community has been skeptical of the stability and depth of the pool of resources man utilizes. This skepticism has caused a surge in concern, as the book notes: “We worry now more than ever before.” The authors contend however, that it is not that resources are scarce, but that alternative solutions must be applied in order to further resource production. The reality is that, “few resources are truly scarce” and access to resources is more readily available now than ever before.

To illustrate the point, the authors present the tale of aluminum, and how it was once highly valued due to scarcity. This rare metal was scarce, not because it was difficult to find, but because of its chemistry. A goldsmith derived aluminum and brought the material to Emperor Tiberius around 25 A.D. The goldsmith was beheaded because he was the only one who knew how to extract this prized material. Emperor Tiberius wanted this material all to himself realizing that its value would decline if others knew the secret “recipe” for aluminum. With that being said, the formula for aluminum died with the goldsmith, and so did the creation of aluminum. However, after many years, other goldsmiths finally recovered the process in which aluminum was produced.

Through this story about the origins of aluminum, Diamandis and Kotler demonstrate the power of the human mind, and its ability for further creation and production. In the book, the authors use similar stories to prove to the reader that abundance is not an idea in infancy but a limitation the world continues to wrestle with after thousands of years. There is one problem, “for the first time in history, our ambitions are beginning to outweigh our capabilities.”

Tying into the idea of establishing a framework, the definition of abundance is given. Abundance, defined as “taking care of basic physiological needs: providing sufficient water and food,” is an ambiguous term. In the book, abundance boils down to the notion of necessity and this simple question—does everyone in the world have enough water and food to continue to live? Is there enough access to resources, which would enable the provision of food and water? Diamandis and Kotler explain that our constant state of worry leads us to believe we are running out of resources and will soon fall insolvent. However, it is not that resources are scarce, but we have not looked hard enough to find them. Those who express optimism coupled with the desire to overcome resource scarcity will alleviate the world’s worry, and prove that abundance is near.

The Pyramid of Abundance

The Pyramid of Abundance illustrates the foundation which abundance is built upon. The abundance pyramid is the road map to abundance. Diamandis and Kotler lay out the instructions for building a secure system and realizing the potential within this model. Beginning with the base, two main categories to be the most important areas of question are food and water. The authors believe the initial problems grow from lack of food and water. The second level of the pyramid holds energy, education, and communication. Once initial needs are met, mankind will begin analyzing the opportunity cost of producing and providing the world with these resources. Finally, health and freedom comprise the top level. Many desire health and freedom yet few are able to obtain it. As problems presented in the lower levels of the pyramid find solutions, the reality of attaining health and freedom grows. As the levels of the pyramid are constructed for people throughout the world, the human race grows closer to attaining abundance.

Ground Level

The base of the abundance pyramid as prescribed by Diamandis and Kotler pertains to the availability of water and food. Fresh water is scarce but desired by millions.. Food production stems from, and relies on, the availability of water. If social entrepreneurs continue to search for solutions to these problems, a foundation for abundance will become evident.

Clean water is a scarce resource and this crisis “affects billions of people everyday.” Many issues stem from the need for water. Wars are fought and nations strike against each other while searching for fresh water.

Therefore, a market for water is realized. Ideas derived from men like Dean Kamen allow the world to believe we can solve the issue of water scarcity. Kamen developed a “little box that had 98 percent energy efficiency and produced a reasonable amount of sterile water.” However, he continued to pivot on his original idea and eventually came up with the “Slingshot.” This machine can purify 1,000 liters of water a day using the same amount of energy a blow dryer uses. His next initiative became distributing the machine. He entered into negotiations with Coca-Cola in order to produce and distribute the machine using Coke’s massive supply chain network. Kamen’s desire to socially impact the world led to the creation of the Slingshot, a machine that can purify most types of water on a large scale. As this story implies, water abundance is a closer reality than previously perceived.

This leads to the availability of food. Without an ample supply of food, millions of people, especially children, are dying to malnourishment or necessary vitamin deficiency. How can food production become realizable through minimum energy usage? Genetically Modified Organisms, or “GMOs”, have potential in this arena as well as genetically engineered seeds. These breakthroughs allow crops to grow in water-strained areas, which in turn, have enabled farmers in the most rural and arid parts of the world to have access to water and fertile soil. Another movement, known as vertical farming, solves other issues. Vertical farming allows crops to grow year round, thus expanding the previously limited farming season to an annual process. According to Diamandis and Kotler, this application “has the ability to increase the amount of food grown per harvest by orders of magnitude and increase the number of harvests by factors of ten.” Vertical farming coupled with genetically engineered seeds leads to a revolution in the way food is produced.

Water and food availability is an issue faced by millions daily. Entrepreneurs and philanthropists continue to search for viable solutions in this arena. With advances in technology and connectivity, our goal for the entire world to have access to ample water and food will become a reality. Soon, billions more will have access to these essential resources.

The Middle Layer

The next layer of the abundance pyramid is comprised of the availability of energy and education. Diamandis and Kotler realize that outside of living necessities, energy and education become the next focus. Energy is essential for power, lighting, machining, and other applications. Where energy empowers machines, education empowers people. Education is vital to society’s success. Educated people can solve problems on their own. With that, information and communication is the platform for education. Once an effective information-trading platform is established, education becomes more accessible. A society will not only survive, but it can thrive with these tools.

Energy is arguably the most important factor for abundance. Energy brings light and power, which facilitates education and communication. Also, energy provides the ability to produce clean water and an ample supply of food. While unorthodox, renewable energies like solar power, biofuels, and nuclear power are potential options. There is a bright future for areas of the world currently without reliable energy sources. Solar energy is becoming less expensive as new inventions explore harvesting solar rays. Further, the U.S. is supposed to achieve grid parity, the point at which renewables become as cheap as traditional resources, within the next two to five years regarding solar power. Solar power is not the only type of efficient energy being explored. For instance, biofuels are becoming a viable energy source due to a movement spearheaded by ExxonMobil. Biofuels are mass-produced on smaller quantities of acreage which, in turn, costs less. Nuclear power is the final outlet explored. Nuclear reactors produce a large amount of power and are safe in the sense they shut off if a problem occurs. Though there is popular backing for the distribution of nuclear energy, more attention is currently given to solar and biofuel energy. The realization that reasonable pricing points are dropping rapidly draws individuals to believe more efficient energy methods will lead to abundance if viable methods for distribution and storage are discovered.

Education, arguably the more important factor in the middle of the abundance pyramid, is vital to a society’s success. Learning must become addictive, like a video game. It must become an enjoyable activity that draws children to cooperate collectively. In recent years, technology has provided many promising new ways to distribute educational resources. The “One Laptop Per Child (OLPC)” movement, for example, is an initiative led by Nicholas Negroponte. He decided that bringing low cost computers to every child would facilitate learning and provide valuable access to the many resources available through the Internet. Through owning computers and tablets, children become enamored with their devices. By integrating educational programs into those devices, half the battle is won. In fact, some studies suggest children would rather learn through automation rather than interpersonal interaction. Salman Khan discovered this when he tutored his cousins via the Internet. Afterwards, he

posted the recorded Skype sessions to YouTube. His cousins returned and asked if he could film all of his lessons and send them the video file. They preferred the pre-recorded videos rather than real time tutoring, and that is how Khan Academy started. If children have access to the Internet and are lead to learning tools similar to Khan Academy, they will initiate the learning process on their own and facilitate their own education.

Education leads directly to empowerment. With energy, education becomes a streamlined process facilitated through the Internet and personal computing. Energy utilization and abundance provides healthier environments for learning, and learning promotes creativity, collaboration, critical thinking and problem solving. Equip children with these tools and the world will become a self-sustaining place. Wars will be avoided due to collaboration, a member in the village will solve issues instead of having them outsourced, and individual connectivity will become the new normal.

The Pyramid's Peak

Health and freedom occupy the highest level of the abundance pyramid. Although healthcare and personal empowerment are two issues that may never be fully solved, many are actively seeking initiatives that will help to provide healthcare and freedom to those who are currently suppressed. Generating affordable healthcare will prolong lives and provide individuals with time to focus on other tasks. The discussion of freedom is far more abstract than the previous topics. It is an idea that leads to the generation of new ideas. Self-empowerment is the leading thought in abundance. When freedom is assured individuals can explore other nuances of life without having to answer to figureheads. The lower levels of the abundance pyramid must be in place in order to explore health and freedom, but as societies continue to develop, health and freedom will become possible.

Health limitations are one of society's major concerns. Life spans are truncated, learning is limited through poor health, and affordable and obtainable diagnostic practices restrict societal improvement. In this, Diamandis and Kotler delve into zero-cost diagnosis, stem cell applications, and predictive, personalized, preventive, and participatory medicines.

Zero-cost diagnostics is vital in providing health care to the masses. Inexpensive devices like X-ray machines the size of thumb drives allowing the user to quickly determine if a bone was broken are being created. Another potential breakthrough is the "Lab-on-a-chip" explored by Dr. Anita Goel. Her technology uses spit samples to diagnose the human system. Also, the mChip, developed by Columbia University, is being refined in order to perform HIV testing. Instead of pouring millions into these technologies, individuals begin with low cost materials and build from the ground up. Zero-cost diagnostics is achievable; it just takes a different perspective to realize the amount of possibilities in this field.

Stem cell research is not a new approach. While researching the human body's natural restoration process, Robert Hariri exposed the possibility of injecting stem cells into the humans, allowing the body to fix itself. Stem cells are the future to curing diseases and scientists are close to developing a low cost way to facilitate this treatment. Also, 3-D printing technology has tremendous promise for applications in the health care field. 3-D printing, applied to natural restoration and the printing of specific organs, would allow for cost effective healing for a variety of ailments. The promise of this technology, combined with its scalability, would create answers to many healthcare issues.

Predictive, personalized, preventive, and participatory (P4) medicine is the final topic discussed by Diamandis and Kotler. P4 medicine is the ultimate goal of modernized healthcare. We have made progress towards the first two types, predictive and personalized medicine. Analyzing DNA and comparing it to millions of data points will allow patients to know what their genes have in store for them. This is described as rapid DNA sequencing. RNA interference is a new technology that "turns off specific genes by blocking the RNA messenger." This alleviates many susceptible victims from ever encountering health care issues. As this field is further explored, new discoveries will come to light, and patients around the world will be exposed to and dodge potential diseases.

The final point of the pyramid is concerned with the topic of freedom. Freedom is a more philosophical aim than those we have already discussed, but, if realized, it will empower every individual. Economic freedom, human rights, political liberation, transparency, the free flow of information, freedom of speech, and empowerment of the individual are topics littered throughout the road to abundance. Economic freedom allows for company growth and stimulation. Provisions for greater human rights break down societal hierarchies across the world, if approached in

the correct manner. Transparency of governments gives citizens the right to establish trust. Self-empowerment is the final key factor in this argument. When empowered, individuals will rise together to stave off terrorism, economic downturns, and other common problems. Give individuals freedom and barriers are broken down. Groups will soar to heights never before realized. Individual freedom becomes an important source for abundance.

Technology – Application & Exploration

According to Diamandis and Kotler, the solutions to many of the problems plaguing societies around the world lie in technology. Diamandis and Kotler explore technology and how its application will alleviate some of the world's most eminent issues. The authors analyze Moore's Law and the lens through which it should be viewed. With that, in order to stay ahead of Moore's Law, individuals must become ultra-specialized in their respective fields. This is not to discourage expansive knowledge but to reaffirm that Moore's Law will not mock mankind's invention. Finally, specific applications of technology lead the reader toward a fountain of optimism. We must begin to specialize in order to outperform Moore's law, and technological application must charge into uncharted waters.

"Exponential growth is a simple doubling. One becomes two, and two becomes four, etc." Exponential technology is the notion that technology triggers exponential growth. It is unclear as to how long Moore's Law will hold factual. We can find clues in the history of telephone line expansion, the rapid increase in Internet availability, and high-speed Internet expansion. If technology continues to grow, abundance will be a simple feat. Diamandis and Kotler describe multiple areas in which exponential technological growth plays a role. Foundational elements of the pyramid of abundance include networks and sensors, artificial intelligence, robotics, digital manufacturing, medicine, and nanotechnology. Out of these topics, networks and sensors, artificial intelligence, digital manufacturing, and infinite computing are the most revered. Technologies applied to each sector will open doors once thought to be permanently sealed.

Networks and sensors build the foundation for connection via the Internet. The world is connected, so much so that it sometimes seems overwhelming. However, we must acknowledge that this will not change. Rather, connection will only increase. Vint Cerf, an employee with the Internet Corporation for Assigned Names and Numbers (ICANN) is considered to be "one of the fathers of the Internet." Vint is proud of his creation but more excited about the potential of connectivity through networks and sensors. The world is a network filled with millions of pieces of data waiting to be connected. The goal is to connect trillions of devices, "thermometers, cars, light switches, whatever." It is matter of time before this breakthrough is realized.

Artificial Intelligence (AI), "the theory and development of computer systems able to perform tasks that normally require human intelligence", reshapes the nature of interaction between humans and the world we live in. Self-driving vehicles like Junior, created by Stanford University's racing team, is a major breakthrough in AI integration. Junior is an autonomous vehicle driven by computers. This is one example of an important concept known as artificial intelligence integration. Major companies create AI divisions because they realize the potential they possess. Other ways AI will influence humans lie within diagnostics, teaching, and a new energy paradigm. Developing fully integrated artificial intelligence will not be easy, but this path will lead mankind to the actualization of the abundance pyramid.

Lastly, a focus on digital manufacturing and infinite computing is the final piece of the puzzle. 3-D printing and cloud computing are the focal points for this specific category. 3-D printing provides the ability to digitally manufacture integral parts through a seemingly simple process. Inexpensive scalability discovered through 3-D printing allows companies to move at an unprecedented speed. Although this idea has been around for decades, innovation in the area allows companies to print using a variety of materials. Biotechnology firms explore the production of organs, hobbyists are producing fully-functioning robots and flying autonomous aircrafts, and concrete buildings are printed in third world countries. If every person were to have access to a 3-D printer, millions of solutions would be quickly solved. Anyone can create physical objects from anywhere. No more waiting on delivery. "3-D printing will be vastly amplified when coupled to infinite computing."

Infinite computing, the idea of access to mass quantities of data and the Internet, used to be referred to as a "scarce resource." However, the cost for computing drops daily allowing for greater access to computing. Cloud computing will become accessible to the masses through inexpensive avenues. Access to computing equips the individual with the ability to find "optimal solutions to complex and abstract questions that were previously

unanswerable or too expensive to even consider.” Pair 3-D printing with infinite computing and the user realizes the capabilities within design and manufacturing. An idea in China can be mobilized and printed in Brazil within hours. The connection of the world becomes unorthodox and a mere byproduct when these technologies become readily available to all.

Infinite computing and 3-D printing, artificial intelligence, and networks and sensors lead us to believe the world will only become more connected as these fields progress. Manufacturing becomes cheaper, connectivity becomes viral, and autonomous machines become more accessible. Developments in these fields allow humans to explore further application of technology. The future is bright and abundance is near.

The Forces Driving Abundance

Three Types of Individuals

Once the Pyramid of Abundance is set, the authors explain the types of individuals who will construct the pyramid. Diamandis and Kotler describe three types of individuals. These roles are more common now than ever before in society, and will continue to drive us towards abundance. The do-it-yourself innovator, social entrepreneur, and tech-philanthropist lead the charge on this particular battlefield. The authors believe these are the types of men and women who will change the world, and without them, hopes for abundance should be buried along with future optimism.

The do-it-yourself innovator traces back to Ralph Waldo Emerson’s 1841 essay “Self Reliance.” Success depends on the notions behind functioning as an independent in a society. Groups must realize it is their responsibility to derive innovation from their resources. Accepting unorthodox trends and, instead of rebelling against these trends, the do-it-yourself Innovator begins exploring ways of implementation. Through this, businesses are born. Individuals accept the challenge and garner economic good from self-empowerment. Let the individual innovate and the byproducts will be positively colossal.

The second type of individual discussed is the social entrepreneur. Social entrepreneurs desire to build businesses around social needs. Their motivation does not stem from the desire to build wealth, but rather from the idea of creating value through solving problems faced by millions. Through this, economic development grows. Bill Drayton best describes this idea by illustrating the need to pair business entrepreneurs with the idea of social reformation. If the world is aiming to aid smaller, less established countries in their endeavors, the social entrepreneur must thrive.

Tech-philanthropists are the final type of individual discussed by Diamandis and Kotler. Tech-philanthropists are individuals who take the wealth they created through technological application and give it to initiatives they care deeply about, referred to as impact investing. The Robber Barrons, the men who rewired America and turned it into an industrial powerhouse are accredited for the idea of philanthropic giving. They decided to distribute huge portions of their wealth to philanthropies around the world. As time churned on, a new breed of philanthropist stepped onto stage. Tech-philanthropists are individuals who take the wealth they created through technological application and give it to initiatives they care deeply about. This is referred to as impact investing. Capital from impact investors is deployed to social entrepreneurs who desire to solve greater issues rather than generate wealth. The force of abundance could be the catalyst for the formation of the others forces. Impact investing leads do-it-yourself innovators and social entrepreneurs to come together and delve into the greatest issues faced by billions.

The aforementioned types of individuals will create abundance. They are the driving force behind this notion. With this type of dutiful mission, abundance no longer seems farfetched. It seems, and is, well within reach.

The Future is Better Than You Think

Diamandis and Kotler emphasize the importance of abundance. They realize the built-up potential in society, and write this book to encourage the fearless to search for their prescribed objectives. They recognize and state the key factors in the abundance pyramid, they understand and empower the individuals who will build this

pyramid, and they dive into the finer details by exploring technology. The abundance pyramid is the road map to the authors main point. Now, individuals must learn and master this roadmap through trial and error. That is where do-it-yourself innovators, social entrepreneurs, and tech-philanthropists are called upon. They hold the key to the kingdom. Self-empowered men and women will continue to drive the forces of abundance. Technological application is the next step. Technology is the future. If Moore's Law hold true, we must exercise the power of the human mind and discover applications in which technology can catalyze abundance. Abundance is near. Solutions to the world's most domineering problems are soon to be discovered. In time, we will far surpass expectations.