

# **Building the Vision: How Bold Projects Are Changing the World**

**Bill Fournet**

President and CEO, The Persimmon Group, LLC

## **Abstract**

Can project management cure what ails our world? From clean drinking water to zero-carbon impact cities, there are hundreds of *Bold* projects in development or execution. These projects seek to transform life on Earth as we know it, and take ideas that were at one point considered science fiction and look beyond the Earth into space. They are happening today. This paper will provide insights into some of these projects through case studies, highlighting the unique factors and challenges driving their success or failure. This is an evolution of typical project management that provides an opportunity to create global impact.

This paper intends to provide project teams with the following:

- Attain techniques and lessons for implementing a vision that others may think unattainable
- Understand the opportunities, challenges, and impacts that Bold projects have on the world today
- Through case studies, learn techniques, factors, and skills required for these mega-projects

## **Introduction**

### **What is a Bold project?**

Despite the absence of an established definition, the term “Bold project” has been used recently to describe projects implementing new ideas which can have life-altering implications for humanity. A Bold project is not simply the creation of something with substantial stature or the development of an expensive technology; it is a project that addresses some of the world’s most basic problems. These projects are derived from true affinity and passion. Founder of the XPRIZE Foundation, Peter Diamandis, and author Steven Kotler associated Bold projects with those that affect at least one billion people globally. Operations of this magnitude fundamentally change the way things function, inspire masses, and redefine our realities (Diamandis & Kotler, 2015).

While many of the core tenants of traditional project management apply to Bold projects, these endeavors also pose some unique and exciting characteristics to provide a new frame of reference for the way in which projects are approached. Delivery leaders for Bold projects must connect project management with the overarching vision of the project while navigating staggering risks. Bold project goals and requirements are abnormally lofty. Projects of this proportion require intricate collaboration, immense stakeholder buy-in, and selfless team member dedication. Some of these Bold projects span multiple continents—even extending beyond our atmosphere – posing additional challenges to team cohesion and operational effectiveness.

By deconstructing and examining some of society's Boldest projects, project managers can glean insight into the ways in which these types of projects encourage better team engagement and increase focus on the desired overall impact through the project’s strategic value.

### **How Did Projects Become so Bold?**

As technology has advanced over the past several decades, society has experienced a flattening of the social hierarchy. No longer are the resources of materials, money, and power limited to only the wealthy few. Technology has opened literally a world of possibilities to nearly everyone. With Internet access available to 40% of the world’s

population (up from 1% in 1995), billions of people have nearly limitless amounts of information available at their fingertips. Individuals can explore dreams and pursue endeavors through web-based platforms where they find information, validation, and even support for their ideas (Internet Live Stats, 2015).

For those of you who were born before, say 2000, consider film photography—that is, actually printing images captured by a camera and developed using traditional film or digital processing. Photographs require time for development, and were somewhat costly (between US\$5.00 and US\$12.00 per roll). Rolls of film themselves cost between US\$3.00 and US\$5.00 a piece, and were limited to only up to 36 photos per roll. The film captured exactly what was exposed to it upon the close of the camera shutter. If the subject’s eyes were closed, you might not know that until after you got your film developed. Add to that the cost of the ever-evolving cameras and lenses. Let’s look at how three economic elements—dematerialization, demonetization, and democratization—have affected film photography.

**Dematerialization.** In 2015, very few people use film or have photographs developed. While a few “classic” photographers may, most photographers use digital cameras, which allow them to capture and review thousands of photos from the camera itself without time or cost to have film developed. Many people do not even own a digital camera, as many smartphones are also capable of taking digital photos. And these photos do not even need to be stored directly on their phones. Many smartphone camera photos are stored in the cloud, allowing photos to be viewed and even shared online. Google’s Photos, Apple’s iPhoto and iCloud solutions, Dropbox, Flickr, Instagram, and even Kodak’s Easyshare are all digital replacements of photo boxes, photo albums, and scrapbooks.

**Demonetization.** Google now provides a terabyte of storage for free. Thousands of photos can be stored and shared for free. If they were captured and processed on traditional film, those same thousands of photos would have cost hundreds of dollars to develop. Technology has presented us with dramatically less expensive options for photography, while personalizing its application through various options, and then expanding its reach through networks of people online. This means more people, regardless of their socioeconomic status, can participate in the art of photography. Someone who, perhaps fifteen years ago, could not have afforded the hobby of photography, may now become a renowned photographer because of this demonetization.

**Democratization.** Today, a teenager could take a photo or video and it could be viewed by millions of people within a matter of hours on the Internet. That same photo could also end up on the cover of *Time* magazine. Twenty years ago that would not have been possible. Today, it happens daily, as user photos and videos appear on news sites, YouTube, and Facebook. Everyone has the *potential* to be a freelance, famous (if only for a day) photographer. Think of the blue dress photo that in 2014 caused millions of online viewers to launch into an argument of whether the dress was blue or white (it was blue, by the way). A great photo? No, not if you judge it on artistry, but it unified the world in memory—similar to the famous New York Times Square photo of the sailor kissing the girl on VE-Day. The inexpensive cost and digitization enable anyone and everyone to participate in the process (Diamandis & Kotler, 2015).

And this is just photography. Today, you can find digital versions of nearly every type of media and reference online. Many times, these resources are available for free. Dictionaries, encyclopedias, user guides, videos, books, tutorials, music, databases, etc. These resources arm individuals from any socioeconomic status or location in the world with the skills, knowledge, and even other people like them to dream bigger and bolder.

## Examples of Bold Projects

Before further deconstructing and expanding on the components that typify Bold projects, let’s set the stage for better understanding the definition by highlighting a few initiatives that exemplify the unique characteristics in question. Each project exemplifies the different qualities that elevate projects to a Bold status while also demonstrating the challenges and pitfalls faced by an undertaking of such magnitude.

### Rainforest Connection

Rainforest Connection is a great example of a Bold project. Topher White, founder of Rainforest Connection, was visiting Borneo as a tourist in 2011 and was immediately mesmerized by the incredible symphony of noise offered by its rainforest. During the trip, White volunteered at a gibbon reserve that was under the constant protection of three rangers, due to the threat of illegal logging in the area. What was surprising to White was just how hard it was to hear the sound of chainsaws in the distance—in a small venture away from the reserve White could hear chainsaws that were obviously very close to the sanctuary. Four years later, Rainforest Connection uses donated second-hand cell phones, powered by solar panels, to detect the sound of chainsaws in the rainforest and alert rangers in real time to help put an end to illegal logging (Butler, 2014).

An initial challenge for White was figuring out just how he could help the rangers in their plight. Once it was understood that the rainforest actually had great cell phone reception and connectivity, the next biggest issue for Rainforest Connection was powering the devices. An engineer by trade, White spent time configuring solar panels that could provide enough energy for the phones to detect the sound of chainsaws in the distance. The rainforest is well covered below the tree canopy and it forced the creation of a hybrid solar panel model that could harness light from several angles. Once White had created his flower-like prototype, the next challenge was placing the devices at a level that would not interfere with wildlife, nor be easily detectable, and ultimately removable, by savvy illegal loggers (Butler, 2014).

Last year, Rainforest Connection raised US\$167,000 in a Kickstarter campaign and is receiving old cell phones from people around the world passionate about the cause. This year, Rainforest Connection will embark on a second major trial in Cameroon and a third major trial in the Brazilian Amazon which will help protect 600,000 hectares of rainforest (Ackerman, 2015).

### **SlingShot**

Dean Kamen, most commonly known for his creation of the Segway, is an inventor that is recognized for his vigor in tackling problems head-on. In an interview with CBS, Kamen stated “fifty percent of all chronic human disease would go away...if you just gave people clean water” (CBS News, 2015). His latest invention, the SlingShot water purification system, seeks to address his notion, transforming any unsafe water into purified, safe-to-drink water without the need for additional chemicals or filters. Using a small amount of electricity, the SlingShot is able to run on solar cells, batteries, or methane; this is truly game-changing technology, and clearly has the potential to impact this entire world. Kamen has been passionate about solving society's biggest problems from an early age, and is now edging closer to a readily available solution in answer to perhaps the top challenge being faced by society as a whole today (Slingshotdoc, 2015).

This is a project that has been in the works for well over a decade, but despite finally producing successful prototypes the SlingShot was still facing significant challenges in distribution. Earlier this year, the reported cost of a single SlingShot is US\$100,000, making them far too expensive to be a realistic option for the majority of individuals living in smaller communities who need this device the most. However, in Kamen's search for strategic partnerships, he created a relationship with Coca-Cola. The beverage conglomerate is incorporating the SlingShot into their Ekocenter initiative. In a recently published asset break down, Coca-Cola stated that one of their goals is “to install and operate 150 Ekocenters in some of the world's most remote and distressed areas across 20 countries by the end of 2015” (Coca-Cola Company, 2015). After many years of R&D and product creation, Kamen's Bold project appears to be nearing the fruition stage.

### **Omni Processor**

In 2014, the Janicki Bioenergy Company presented the Omni Processor. This device converts raw sewage into electricity and drinkable water, and is sponsored by the Bill and Melinda Gates Foundation. The Omni Processor operates on a large scale, and a model is currently being developed that can produce 86,000 liters of drinking water per day, along with 250 kW of energy, all essentially from the human waste of 100,000 people (Chowdhry, 2015). Janicki Bioenergy hopes to create a lasting solution to two of the world's more pressing issues at once—lack of access to clean water and lack of proper waste disposal. Another great facet of the invention is that investors in the Omni Processor would get paid for taking the input (the waste), as well as earn income for what the machine outputs—the clean drinking water, the electricity, and the ash (The Gates Notes, 2015).

Some of the challenges now being faced following the Omni Processor's creation include gaining a true understanding of the scope of the issue in other countries and finding entrepreneurs willing to invest in the machine. Without a clear understanding of these things, the Janicki team may not have a cost-effective model. The Omni Processor's development team is currently launching a pilot project in Senegal later this year, as well as travel to other parts of Africa and India to assess needs. A very real concern is the process for problem diagnosis during the pilot project in Senegal, but Gates expressed that he was encouraged to see the team's readiness via a system of sensors and webcams that will enable engineers to troubleshoot issues remotely. Provided that the Janicki team experiences success in Senegal, the next step is to find partners in the developing world and take the apparent win-win model across nations for substantial global impact (Chowdhry, 2015).

### **Masdar City**

Masdar City is a carbon, waste, and fossil fuel free initiative in a high-energy usage country. Developers envisioned the "city of the future" when embarking on this project in 2006, in the United Arab Emirates. It utilizes ancient methods, in addition to new technologies for the purpose of dramatically slashing energy usage. Along with serving as office and residential space, Masdar City will act as a centralized think-tank for renewable energy research. The initiative is not simply creating a sustainable eco-city within a vacuum, but it is intended to inspire the culture as a whole in regards to ecological awareness. Manufacturers and service providers in the supply chain for the city's components were the first to realign their processes with the most stringent eco-friendly standards; this is only the very beginning in the eyes of Masdar's developers.

Masdar City has faced substantial challenges since concept inception and is still fighting through many today. A primary cause of resistance was the global financial crisis that hit in 2008–2009. Due to those events Abu Dhabi was forced to aid in the bail out of Dubai, and as a result had far less to spend on its own projects—Masdar being one of them, of course. Overnight, hopes of finishing the site by 2015 were shattered. In initial proposals, 2015 should have seen the facilitation of 50,000 residents and 40,000 commuters in Masdar City; in 2010 the end date was pushed back to 2025, and by the close of 2013 there was no set project completion date for Masdar (Marwitz, 2013). As of 2015, barely 100 students inhabit the city and further development has been halted (Eymeri, 2014).

Despite major criticisms and question marks over the eco-friendly city, Masdar investors and enthusiasts are still confident that the project will yield a result unlike anything seen before. The vision for Masdar City is that it will not only be a cutting edge idea that represents the mindfulness to be taken in protecting the planet, but that it will also harvest the next generation of great ideas that lead to increased global sustainability (Kingsley, 2013).

### **Human Genome Project**

This US\$2.7 billion, publicly funded endeavor was initiated in 1990 and completed in 2003, two years ahead of schedule and under budget (National Human Genome Research Institute, 2003). The Human Genome Project saw the co-working of geneticists from around the world, and is to date the world's largest collaborative biological project. The goals of the project were to accurately determine the sequence of all 3 billion DNA base pairs that make up the human genome, as well identify all of the 20,000+ human genes (National Institutes of Health, 2003). Since the project's completion, the technology used to map genomes and research techniques pioneered by the project have become increasingly prevalent and inexpensive, which has allowed for the identification of susceptibility to certain genetic diseases or conditions (Gannett, 2008).

A project of this magnitude encountered its share of challenges along the way; the ways in which scientists needed to compile such vast amounts of data brings in database considerations immediately. Further observing interactions between the scientists, it is clear that cultural differences and nomenclature could easily cause significant communication problems; this research crossed borders and linguistic barriers where scientific terms may mean very different things—hurdles that had to be overcome throughout the entirety of this Bold project. The Human Genome Project had a dire need for accuracy, given its potential impact on genetic studies for generations to come. This understanding would suggest a steadiness of pace in order to ensure the highest possible degree of accuracy in data gathering and recording. However, the scientists also had to be conscious of their timeliness for the fear of public funding drying up before the sequence could be completed—while private sector funding was readily available if time were to run out, the introduction of those dollars would in turn brand the collected data proprietary information.

The Human Genome Project is recognized as the largest biological project ever and it has been monumental in the way large medical research projects are conducted since its completion. The project essentially introduced big data into the field of genetic research and has allowed doctors all over the world to better determine the ways in which they can help patients, and also show them the power in collaborative research. The impact of this Bold project on patient care and diagnosis, research, and the sharing of knowledge ripples far beyond project completion.

### **New Horizons**

Project manager, Glen Fountain, likened the Pluto New Horizons mission to making a hole in one on a golf shot from New York to Los Angeles (Achenbach, 2015). New Horizons is a mission that is intended to help the human race better comprehend the extreme outskirts of our solar system by making the very first reconnaissance of Pluto, as well as venturing even further out on the Kuiper Belt. The project boasts a broad time span, like many other Bold projects, mostly because of the time required for the spacecraft to travel so deeply into space. New Horizons launched on January 19, 2006, and was scheduled to conduct its five-month long reconnaissance study of Pluto and its moons this summer. From there the mission will continue in order help NASA glean a visual understanding of the Kuiper Belt.

The distance between the Earth and Pluto immediately presented power challenges for the New Horizons team. The sun's rays are entirely too weak to generate power at that distance and consequently the team was forced to identify another viable energy source for the spacecraft in the project's early stages. Further early-stage issues that had to be considered, again due to distance from the sun, included keeping the spacecraft warm enough for the machines on-board to continue to function effectively, and also accounting for communication delays as a one-way messages can take several hours (Howell, 2015).

Although the project has not, at this point, surfaced any conclusive data on Pluto, it has proven successful in its primary feedback and the New Horizons team will soon be able to assess the planet's characteristics before venturing even further into space. This example of a Bold project will not only settle some dispute over Pluto's classification but will provide currently unknown information about the deepest, darkest corners of our solar system. It also serves as the inspiration for a new generation that will create the vision of the next great human achievements in space exploration.

### **Building the Vision**

For many Bold projects leaders, their vision creates an emotional pull that incites action and unifies the project team. Vision instills a sense of purpose and breeds trust within the team as they work towards the same end. This vision permeates every aspect of the project's Bold pursuits. Although not every project promises the allure of space travel or solving world crises, vision is substantial to project success in every level of team engagement.

Consider Topher White's Rainforest Connection. The vast majority of help his organization receives comes from volunteers and donations. He fostered this vision for four years after he was initially exposed to illegal logging in Borneo. Launching Rainforest Connection required navigating many obstacles and complications and soliciting help from other environmentalists and forest law-enforcement groups. His passion to address deforestation, the second largest contributor to climate change, led him to quit his job to form the non-profit. His vision to protect millions of hectares of forest has mobilized a global network of support.

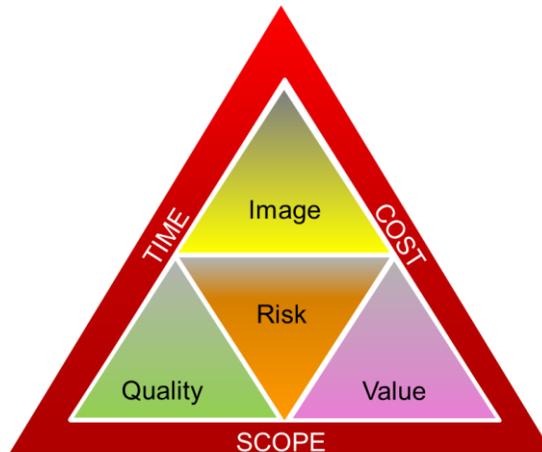
Whether your project aspires to curtail global warming or to simply successfully implement a new enterprise resource planning software, by casting a Bold vision, your project can find Bold results.

The key to framing a compelling vision is to connect the project to both sentiment and intellect. It should be concise and straightforward, while also providing motivation and direction for the project. The vision should resonate with the team on an individual level, while also fostering a sense of camaraderie within the team itself. Team leadership is vital to establishing a vision and ultimately project success.

### **Execution Model for Bold Projects**

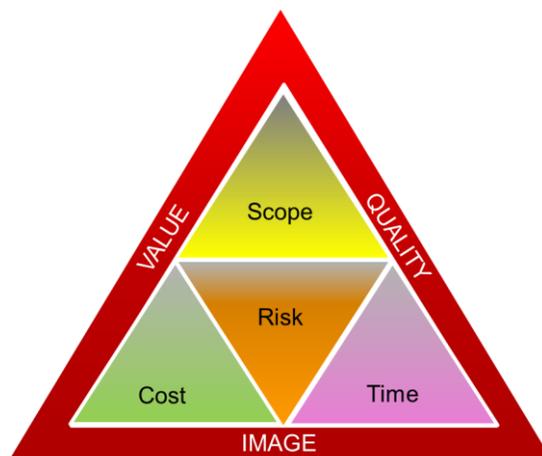
This evolution of the PM triangle, while essential for Bold project success, provides tremendous insight which can be applied to projects of any size to improve team performance and improve project success.

In 1987, Dr. Harold Kerzner published the PM Triangle (Exhibit 1) to illustrate key factors project managers should apply to better define and manage their projects. The Triangle is incredibly useful in providing project teams with project management processes and techniques. These processes and techniques are helpful in providing guidance to internal and external stakeholders regarding how project scope, schedule, and cost relate to one other and how changes to any of them can impact those stakeholders and the project itself (Kerzner, 2015).



**Exhibit 1: Kerzner’s PM Triangle (The Triple Constraint).**

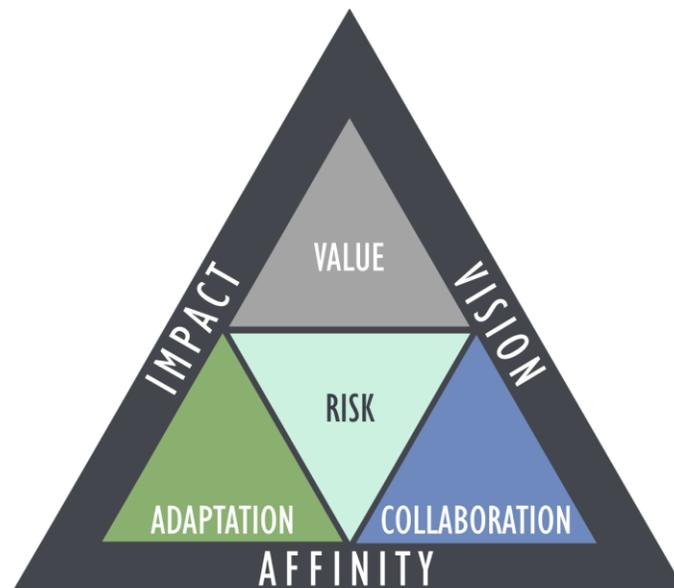
As our world has become more uncertain and the speed of business change has increased, however, the Triangle Kerzner designed in 1987 has become outdated. Many modern projects now face chaotic environments as well as constantly changing requirements and needs. To combat this chaos, these projects utilize collaborative tools for agility and workforce changes; resulting in “flatter” and more fluid team interactions and a greater impact on corporate strategy. To address many of these changes, Kerzner published Project Management 2.0 in 2015 which included an updated PM Triangle (Exhibit 2) (Kerzner, 2015).



**Exhibit 2: Kerzner’s updated PM Triangle (Competing Constraints).**



Managing Bold projects requires the application an expanded version of the PM Triangle, because these projects have characteristics and drivers that are either atypical to or enhanced beyond typical project management applications. Exhibit 3 illustrates these characteristics, many of which already exist in “normal” projects, but are amplified in Bold ones. On the outside of the Bold Triangle are Vision, Impact, and Affinity. These three drivers are required to create and manage a Bold project. Inside the Bold Triangle are Value, Collaboration, and Adaptation through which the team(s) thrive and sustain a Bold project. They surround Risk, where decisions and directions are weighed.



**Exhibit 3: The Bold Triangle.**

## The Triangle’s Edge

### Vision

As described earlier, Vision is the starting point of the Bold project. It ignites the energy, human and capital resources, and establishes the framework that defines project success. For Bold projects in particular, without a strong, clear, and rallying Vision, the project may not survive for very long. Vision, however, only initiates the project. Without the rest of the Bold Triangle, the project remains simply an idea. Take, for instance, Dean Kamen’s SlingShot concept. Kamen may be known for his Vision as an established innovator, but the idea of making safe drinking water to the world is not Bold unless it takes the next steps necessary to becoming a reality.

### Impact

Bold projects make an impact. They “change the game” of how we live or interact with each other in the world. For instance, the invention of the light bulb changed how we work, how we live, and opened up all 24 hours of the day to us. The light bulb was a game-changer. Impact takes the Vision from being an “idea” to being a “great idea.” The two work in tandem to provide the measure of success (i.e., *why* we are working on the project) as well as the



scope (i.e., *what* we are working on). Impact must be simple and yet strong enough to keep people engaged in the effort when challenges present themselves. Impact enables resiliency in the project. Another factor in making a case for the importance of Impact is legacy. For instance, the global collaboration and the data gathered by the Human Genome Project has unlocked new frontiers in almost every facet of medical science like the genome-editing technology CRISPR that has the potential to revolutionize the treatment of disease (Storrs, 2015). While human application may not be possible now, this new technology provides insight into the basic building blocks of all living organisms. The creators of the Vision for the Human Genome Project could not have imagined this application for their research, but Bold projects are often found to be the root of exponential change.

### **Affinity**

Creating an environment (physical or virtual) of cohesion within the project team is integral to any project's success. In Bold projects, teamwork and morale require a deeper sense of engagement: affinity. Affinity means people passionately want or seek to give of themselves to be a part of the project. In the Rainforest Connection, many of the project team members give their time and intellect freely, for no pay or reward beyond their belief in the cause. Recent inventions and breakthroughs, such as the HACKberry prosthetic arm (Hurst, 2015) and MindReader facial recognition software (Khatchadourian, 2015) are being shared openly by their Creators. A decade ago, it was unheard of for idea creators or companies to openly share their intellectual capital for products or technologies that could make them millions or billions in the marketplace. Today this happens regularly in Bold projects. Why do they share it? As Rana el Kaliouby relates in her TEDTalk:

*Our biggest challenge is that there are so many applications of this technology, my team and I realize that we can't build them all ourselves, so we've made this technology available so that other developers can get building and get creative. We recognize that there are potential risks and potential for abuse, but personally, having spent many years doing this, I believe that the benefits to humanity from having emotionally intelligent technology far outweigh the potential for misuse. And I invite you all to be part of the conversation. (TED, 2015)*

As a result of this open source technology, her team has developed an emotional language translator that will enable autistic individuals to understand other people's expressions. The impact of this development is a game-changer for autism.

Affinity within the team enables a culture of individual ownership within a larger collective team that fuels the overall vision across the span of the project. Strong rapport within the team preserves the integrity of the vision and creates a greater reach as each team member becomes a project advocate. Affinity is the "glue" in the execution of Bold projects.

### **Inside the Triangle**

If the Vision, Impact, and Affinity frame Bold projects, then Value, Collaboration, and Adaptation are what keeps them alive, and Risk is what keeps them in balance. Regardless of the level of formality or location within the project, execution teams breathe life inside of the Bold Triangle. They ensure the scope adapts to the challenges and failures encountered. They also exploit successes. They enable perseverance through difficult times and enable the attraction of new members and new ideas into the team.

### **Value**

The vision must be supported by clear, substantive value. Ideally, the value created resonates personally but also proves to be sustainable. From the top down, the project team owns the delivery of this value. They connect with it individually and can communicate it with clarity.

### **Collaboration**

Successful Bold projects allow for collaboration across small, highly talented, multi-disciplinary teams. These teams are given ownership of their work from concept to completion. Technologies such as Yammer, Slack, GoogleDocs, and Evernote enable the exchange of ideas and documentation to flow freely, regardless of who you

work for or where you work. FaceTime, Google Hangouts, and other video telecommunications software make team members available to one another from virtually anywhere in the world at no cost.

While strong egos, ideas, and opinions still exist and thrive in these efforts, a servant mentality is the basis for collaboration. Just as within a top-tier sports team or a Navy SEALs unit, the servant attitude strengthens everyone's abilities. It also allows team members to move fluidly between teams without negatively affecting performance. The shared purpose created by the Vision and Impact reduces the typically destructive effects that can occur when strong personalities work together in creative efforts.

### **Adaption**

When bold teams operate with this sense of ownership, it provides a platform for open sourcing of ideas and solutions as Bold project teams adapt with agility. Iterative improvements in process or technologies allow project teams to continually reinvent themselves and capitalize on new technologies. Adaptive agility allows for these bold teams to readily accommodate for risks, challenges, and changes as they occur.

### **Risk**

Bold projects make waves. As a result, these projects face bold challenges. To combat these unique challenges, team leaders should create adaptive risk management plans with integrated contingencies that accommodate for the impending risks and obstacles that will inevitably occur. Factoring in these assumed failures—and not allowing them to derail or demoralize the team—will minimize the impact of these failures when they do materialize and bolster Bold success.

### **Challenges and Pitfalls**

Each component of the Bold Triangle poses equal significance to Bold project success. Without even just one of the elements, Bold projects may falter. Without Affinity, project teams lack the cohesion required to incite passion, foster individual ownership, and cultivate innovation, all of which are critical to project success. When the Vision is constrained, the project lacks the framework require to even translate an idea into execution. Failing to accommodate for risks—particularly on a project of Bold magnitudes—can cripple a project and thwart adaptation.

### **What's On the Horizon**

If the aim of Bold project is global change, what does the future hold? For a moment, think of the global landscape portrayed in the genres of fantasy and science fiction, remember the future you dreamed of in the unfettered world of your childhood imagination, consider the impossible. This is the reality of Bold projects.

### **Achieving Teleportation**

The future has a way of becoming the past. Men have walked on the Moon. A significant number of people carry around a complex communication device with the ability to transmit voice, image, and video almost instantly across the globe. Teleportation is still the realm of Hollywood movie magic and science fiction. The idea of being beamed across space is a fond wish, but the truth is that molecular human transport is still problematic. The idea of teleporting data, however, is another matter entirely. A study published by researchers at the Delft Institute of Technology in The Netherlands revealed that they have achieved the first stages. Imagine what the next phase of this technology holds for the transportation industry, clean energy initiatives, and social globalization (Kluger, 2014).

### **Revolutionizing Our Basic Building Blocks**

What will the future of construction look like when materials take on adaptive properties such as self-healing concrete? That far-fetched concept has already been realized by Henk Jonkers, a microbiologist at Delft University in the Netherlands. Using bacteria, the scientist has given the world's most common building material the ability to restore stability and material integrity without human intervention when cracks begin to form (Stewart, 2015).

### **Advancing 3-D Printing**

When Chuck Hull invented the first 3-D printer in 1983, his target audience was design engineers. He never imagined that over 30 years later his idea would lead to the democratization of manufacturing and some of the most innovative advances in medical technology (Ponsford & Glass, 2014). Major manufacturers may become software vendors in the next decade. Imagine replacing a damaged pair of shoes by placing them in a material recycler and printing out a brand new pair. The medical applications will be truly transformative. Three-dimensional printing is already being used to design custom joint replacements and prosthetic limbs for patients, and Dr. Daniel Stolyarov is conducting 3-D printing experiments with Graphene, which is flexible and 100 times stronger than steel. Now that you've imagined the future of 3-D printing, think about the possible applications of 4-D printing (Smith, 2015).

### Reimagining Lasers

From building powerful weapons and changing your eye color, the practical applications for the laser are endless. Swiss physicist Jean-Pierre Wolf is working to add another major accomplishment: changing the weather. His emerging technology would offer a cleaner alternative to cloud seeding. In parts of the world impacted by severe flooding and crippling drought, this technology has the potential to save lives (Prisco, 2015).

### So How Can You Be Bold?

The true constraint to the possibilities for Bold projects is the vision created by the human imagination, and even that may not be much of a limitation as artificial intelligence advances. The greatest potential for Bold projects resides in the evolving mind-set of project leaders. Innovative thinkers require assistance to realize their vision, and today's project managers are uniquely positioned to make achievable those "impossible" ideas previously thought of as the stuff of dreams. While it may be the case that there are limited numbers of project managers currently working on Bold projects, every project regardless of its scale can benefit from a project leader who embodies the qualities and characteristics that set Bold projects apart. More importantly, today's project managers are the best teachers of tomorrow's project leaders. The traditional constraints and phases are foundational stepping stones for the field of project management as it attempts to keep pace with exponentially advancing technology.

Now, go be Bold!

## References

- Achenbach, J. (2015). New Horizons is just hours away from Pluto after 9.5-year journey. *The Washington Post*. Retrieved from [http://www.washingtonpost.com/national/health-science/new-horizons-is-just-hours-away-from-pluto-after-95-year-journey/2015/07/13/ce4ab61a-294c-11e5-bd33-395c05608059\\_story.html](http://www.washingtonpost.com/national/health-science/new-horizons-is-just-hours-away-from-pluto-after-95-year-journey/2015/07/13/ce4ab61a-294c-11e5-bd33-395c05608059_story.html).
- Ackerman, E. (2015). *Topher White: Repurposing cellphones to defend the rain forest*. Retrieved from <http://spectrum.ieee.org/geek-life/profiles/topher-white-repurposing-cellphones-to-defend-the-rain-forest>.
- Butler, R. (2014). *Discard cellphones to help fight rainforest poachers, loggers in real-time*. Retrieved from <http://news.mongabay.com/2014/06/discarded-cell-phones-to-help-fight-rainforest-poachers-loggers-in-real-time/>.
- CBS News. (2015). *Welcome to Dean Kamen's cool world*. Retrieved from <http://www.cbsnews.com/news/welcome-to-dean-kamens-cool-world/>.
- Chowdhry, A. (2015). *Watch Bill Gates sip water made from sewer sludge*. Retrieved from <http://www.forbes.com/sites/amitchowdhry/2015/01/10/janicki-omniprocessor/>.
- Coca-Cola Company. (2015). Ekocenter SlingShot brochure. Retrieved from <http://assets.coca-colacompany.com/47/24/b7919b0a471fb636ba038f55ca9e/ekocenter-slingshot-brochure.pdf>.

- Diamandis, P. & Kotler, S. (2015). *Bold: How to go big, create wealth and impact the world*. New York, NY: Simon & Schuster.
- Eymeri, J. (2015). *Eerie video shows Masdar City—the sustainable city of the future—has no one in it*. Retrieved from <http://www.fastcoexist.com/3035446/eerie-video-shows-masdar-city-the-sustainable-city-of-the-future-has-no-one-in-it>.
- Gannett, Lisa. (2008). The Human Genome Project. *The Stanford Encyclopedia of Philosophy* (Winter 2014 Edition), Edward N. Zalta (ed.). Retrieved from <http://plato.stanford.edu/archives/win2014/entries/human-genome/>.
- Howell, E. (2015). *New horizons: Exploring Pluto and beyond*. Retrieved from <http://www.space.com/18377-new-horizons.html>.
- Hurst, N. (2015). *Open source prosthetic hands focus on function and personality*. Retrieved from <http://makezine.com/2015/06/16/open-source-prosthetic-hands-focus-function-personality/>.
- Internet Live Stats. (2015). *Number of Internet users*. Retrieved from <http://www.internetlivestats.com/internet-users/#sources>.
- Khatchadourian, R. (2015). We know how you feel. *The New Yorker*. Retrieved from <http://www.newyorker.com/magazine/2015/01/19/know-feel>.
- Kingsley, P. (2013). *Masdar: The shifting goalposts of Abu Dhabi's ambitious eco-city*. Retrieved from <http://www.wired.co.uk/magazine/archive/2013/12/features/reality-hits-masdar>.
- Kluger, J. (2014). *Teleportation is real and here's why it matters*. Retrieved <http://time.com/2800071/teleportation-quantum-entanglement/>.
- Masdar City. (2015). Retrieved from <http://masdar.ae/en/>.
- Marwitz, J. (2013). *The failure of Masdar City*. Retrieved from <http://projourno.org/2013/10/the-failure-of-masdar-city/>.
- National Human Genome Research Institute. (2003). *The Human Genome Project completion: Frequently asked questions*. Retrieved from <https://www.genome.gov/11006943/>.
- National Institutes of Health. (2003). *What were the goals of the Human Genome Project?* Retrieved from <http://ghr.nlm.nih.gov/handbook/hgp/goals>.
- Ponsford, M. & Glass, N. (2014). *'The night I invented 3D printing'*. Retrieved from <http://www.cnn.com/2014/02/13/tech/innovation/the-night-i-invented-3d-printing-chuck-hall/>.
- Prisco, J. (2015). *The man who wants to control the weather with lasers*. Retrieved from <http://www.cnn.com/2015/04/24/tech/laser-cloud-seeding-mci/index.html>.
- Slingshotdoc. (2015). About section. Retrieved from <http://www.slingshotdoc.com/>.
- Smith, R. (2015). *5 incredible trends that will shape our 3D printed future*. Retrieved from <http://www.forbes.com/sites/ricksmith/2015/07/07/5-incredible-trends-that-will-shape-our-3d-printed-future/2/>.
- Stewart, A. (2014). *The 'living concrete' that can heal itself*. Retrieved from <http://www.cnn.com/2015/05/14/tech/bioconcrete-delft-jonkers/>.
- Storrs, C. (2015). *Could the DNA-editing CRISPR revolutionize medicine?* Retrieved from <http://www.cnn.com/2015/08/12/health/genesis-engine-dna-crispr-editas/>.
- TED. (2015). *This app knows how you feel—from the look on your face*. Retrieved from [http://www.ted.com/talks/rana\\_el\\_kaliouby\\_this\\_app\\_knows\\_how\\_you\\_feel\\_from\\_the\\_look\\_on\\_your\\_face/transcript?language=en/](http://www.ted.com/talks/rana_el_kaliouby_this_app_knows_how_you_feel_from_the_look_on_your_face/transcript?language=en/).

The Gates Notes. (2015). *Janicki Omniprocessor*. Retrieved from <https://www.youtube.com/watch?v=bVzppWSIFU0>.