

GLOBAL FUTURES FORECAST

GFF 2013

The Top Trends that will Shape the Coming Year



Dr. James Canton, CEO Institute for Global Futures

Executive Summary

Complex radical change, both risk and opportunity, will define the next year. New trends will change the game of business, government and society. Every person, government and organization must get ready now for the trends that will drive the future.

This year's theme is about being Future-Ready, the capacity to leverage, monetize and adapt. Being ready for these emerging trends, the capacity to adapt and learn now how to prepare for risks, competition and opportunity is essential to thriving in 2013. This forecast is a recognition that serious changes are emerging faster than even the forecasts can keep up with. The extreme future is coming fast.

First published in 1990, **The Global Futures Forecast** continues to be an insightful resource for business, entrepreneurs and government leaders who need to know what's coming next—the risks, challenges and opportunities that will shape the future. **The Global Futures Forecast** is published by Dr. James Canton, CEO & Chairman of the Institute for Global Futures. IGF is a leading think tank based in San Francisco, California that provides keynotes, consulting and forecasts on global trends and business strategy for the Fortune 500, entrepreneurs and government. We have identified the key trends that we think will create risk, progress and opportunity this coming year.

The themes this year will be velocity, innovation and learning. Changing fast and deep enough to embrace new opportunity, will be vital for every organization. Every organization must transform itself to becoming an innovation network that attracts talent, enables new learning, fosters productivity and offers insight. This will be a key strategy for every leader and their organization to embrace—Innovate or die.

Trend Convergence is also a theme of the new year. It defines how different trends converge and suggest a new way to look at trends as combinations of forces rather than as linear or isolated trends. Computing, biotech and the aging Baby Boomer generation, economic wealth and the desire for living

longer and healthier is transforming health care, is one example of Trend Convergence.

This coming year will be a refresh for many and trying for others who are not changing fast enough as leaders, organizations or governments. What we mean about changing fast enough is that learning, creating, innovating and realigning their organizations to be of Strategic Value to customers is of paramount importance. Embrace the velocity of change and thrive in 2013. Here's what's next:

Innovation Nation

Are you living in a Innovation Nation? Innovation, science and technology are still the key driver of GDP in the US and EU but too few other nations around the world. Over one third of US GDP is innovation driven. The business of investing in the six basic sciences—nano, bio, neuro, info, robotics and quantum will transform the competitiveness and prosperity of nations and economies. The key to prosperity as well as a higher quality of life, is science and innovation investments. The US is still the leader in nanotech patents for example.



The number of nanotechnology patents has grown continuously since 2000. Between 2007 and 2012 the total number of U.S. patent applications, U.S. granted patents and published international patent applications grew from about 14,250 to almost 18,900. US leads in mobile, online and IT as well. But Asia is coming on strong especially Korea, Japan and of course Singapore where innovation is celebrated. China is moving fast in this direction. Innovation drives prosperity. More then ever, innovation cultures will define the future sustainability of a nation. Innovation nations will attract the talent, the capital, the assets, the business and see their economies soar. Nations that provide easy open access to communications, mobile and online education, information and trade will see robust innovation growth in markets and prosperity.

Are you supporting the next generation of education, health care, security and energy innovations? Does your nation support the next generation of science and technology that will drive opportunity, sustainability and growth? One way to measure the Innovation Capacity of a nation (inventiveness in research and development) is by the number and types of patents it produces. This is an easy metric to evaluate. What is your Innovation Capacity?



M Commerce Explodes

Mobile commerce may exceed forecasts of \$214 billion before 2015. All business is being transformed by the mobile Internet. The fusion of social media and online commerce over mobile will become the largest global marketplace. These forecasts are low because they don't consider the non-traditional mobile markets such as telehealth, gaming, entertainment and teleconferencing that are emerging. Mobile commerce, driven by millions of apps, smart phones, cloud computing and newer faster chips (thanks again to Moore's Law) are creating a revolution that is unprecedented.



The Internet of things, where every “thing” has an IP address tied to the Internet is emerging this year. Look for phone and app's based e-wallets, enabled by NFC, Google Wallet and ISIS to explode this year. Brands take notice. Consumer adoption of mobile commerce is just starting. This coming holiday season will complete the transformation. Billions in business will go to the mobile commerce platform—music, health, learning, communication, entertainment. This is a megatrend of huge proportions. It is the next evolution of the business. Think mobile. Think success.

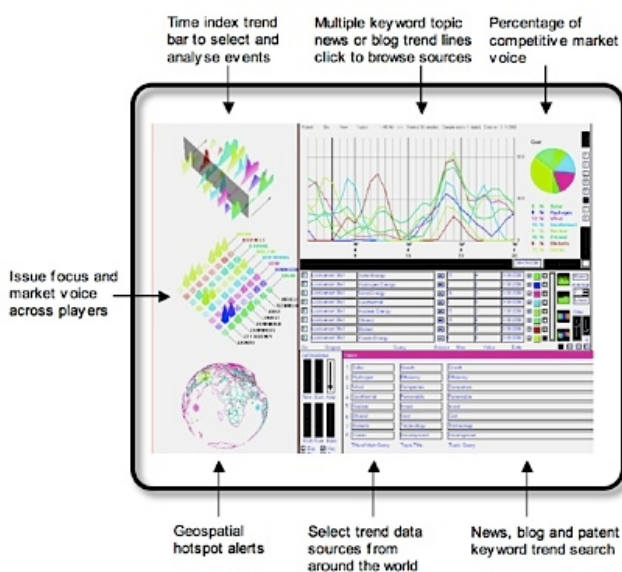
The Social Media Enterprise

Too many organizations think that social media usage is for kids, bored Gen X, consumers and soccer moms. They are missing the point. Enterprise social media is a game changer for business. It can transform the enterprise's stodgy culture to make it more dynamic, collaborative, and real-time. Integrating social media such as Instagram, Twitter, Facebook, YouTube, Slideshare, and Pinterest could change the way your workforce culture interacts making them consumer savvy and interacting with each other, well like consumers. Think Agility think social media.



The Predictive Organization

Business is evolving fast. The ecosystem of businesses that collaborate, link, share and compete is being transformed. Every organization is a predictive organization—whether they know it or not. How well they are doing at prediction defines their Prediction Capital as a business--did they get it right about that trend in social commerce or are they ready for mobile business? Every day we spend at work predicting what customers will think, buy, need and desire. Your Prediction Capital determines what product or service to make.



This actually defines success. Why people will want this or not in the future. Prediction is the background of obviousness to organizational culture its just invisible to many. Prediction is fundamental to the strategic success of an organization. The real question is how well is your organization doing on anticipating the future?

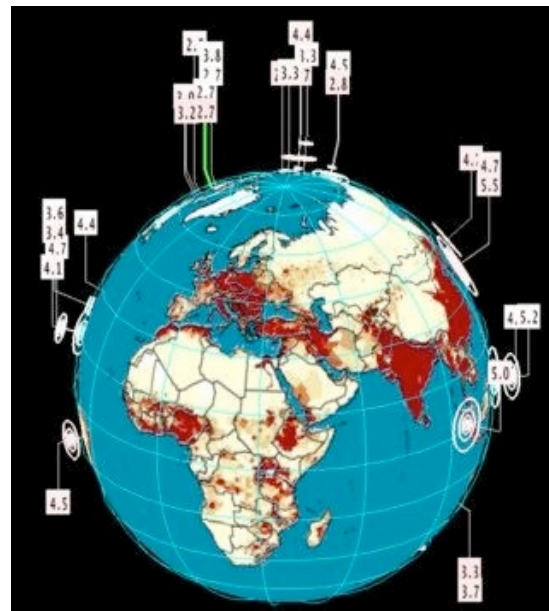
Predictive analytics, predictive simulations and data science are going to become critically important to managing global organizations given the

complexity of markets, competition and fast change. When you combine big data analytics with prediction you have a vastly different organization and access to new tools of insight. Companies that get this are growing. Blab <http://blabpredicts.com/home> predicts what customers are saying about brands. Leap Commerce <http://leapcommerce.com/> predicts what your customer will buy. Google predicts what you want to search for. Amazon predicts what you'll need and when. Facebook predicts brands users want to associate with. How are you doing in the prediction game?

Sustainable Cities

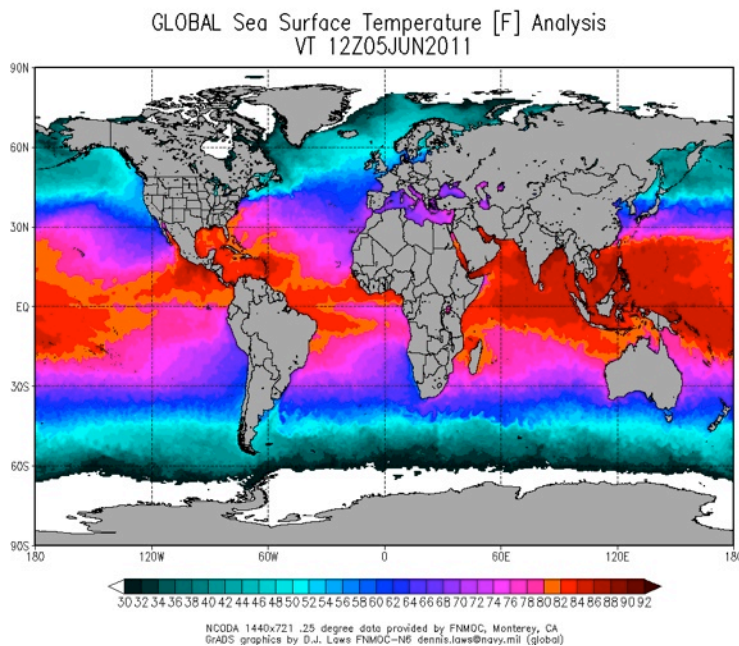
Cities must become sustainable to remain relevant environments of prosperity and quality of life. Sustainable cities are essential to the future of the planet. In 2010, 82% of Americans lived in cities; by 2050 it will be 90% according to Siemens. Wealth and buying power on the planet is moving to cities. We must build and retrofit cities to become healthy, secure and environmentally responsible urban centers for humanity.

Cities today are responsible for around two thirds of the energy used, 60% of all water consumed and 70% of all greenhouse gases produced worldwide. The challenges and risks facing the future of cities are immense—security, water, transportation, power, environment, health, and work are just some of these critical areas. Sustainable cities must become more environmentally clean, non-polluting, energy efficient, while increasing the quality of life for their residents, and enabling social responsibility. Building the sustainable cities of the future will be a massive new economic engine of growth.



Extreme Climate Change

The rise of global disease. Tornadoes in the U.S. Northeast. Drought in the Middle East. Tsunamis in Asia. Extreme warming in Europe. Cat 5-like storms in NY. Glacier melt in the arctic. Abrupt climate change is here. This is a global risk factor that governments are not effectively dealing with on a scale that it will make a difference. Business and personal actions will make a difference. Billions of dollars and Euros worldwide will be spent trying to offset climate change. The obvious science models we have used for over 100 years on climate modeling are becoming useless in the face of accelerated climate change. We need better Big Data and analytic forecasting to prepare



for the future. Climate changes on rising sea levels and arctic melt are defying scientific experts. We are not modeling fast enough to keep up. Our science models are inadequate to forecast accurately to prepare for extreme change. What does this mean? The global population of over 70% lives near or close to coastal regions that are most at risk for climate change.

Geoengineering projects like the Capstone Project could make a difference. Insurance on real estate modeling is outmoded. Rising sea models simulate sea level increases that are unsustainable given current storms. Disaster relief preparation is based on the past and is not Future-Ready. As storms continue with extreme changes, from heat to cold, we are not globally prepared to deal with the future of extreme weather. Best prepare now.

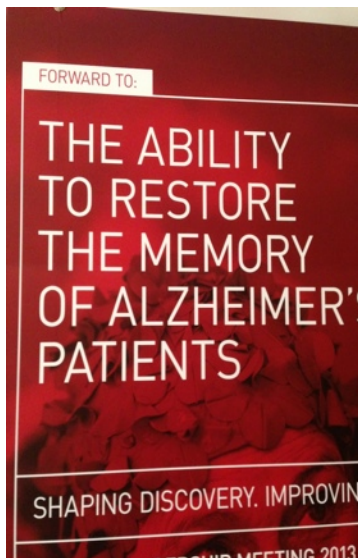
The Robots R Coming

Robots are changing our world faster than we think. Exponential shifts in innovation from sensors to computers to mobile are enabling robots to emerge in entirely new forms. This year expect mobile autonomous bots, from tiny hand held drones that fly to those that work in factories, to robo surgeries becoming the norm. Look also for the virtual bots, navigating the Internet monitoring millions of data of Exabyte transactions. Robots in many forms will become a pervasive part of our world.



Personalized Medicine

We are on the edge of redesigning medicine. A more preventive, predictive and personalized medical model is emerging. From epigenetics which looks at the heredity role in gene expression for obesity, to fast gene analysis of our DNA, to the customized drugs we will be manufacturing on-demand, to telehealth, big data, geo-medicine and population economics, to nano-virus drugs to nano-devices; medical innovations are fast transforming health care.



The combination of synthetic biology and molecular medicine is creating a new model for the future of medicine. Neuroscience is challenging our very notions of what role the brain has in health. The current medical model is under fire, shifting from a disease-focus to a wellness focus.

Biotech and health care are merging. Regenerative medicine is creating a new field where longevity is progressing. Digital and mobile health apps enable better health care. A more precise, cost-efficient and patient-focused care is coming. This year personalized medicine will break out of the research phase, companies like WellPoint and IBM's Watson, an artificial intelligent computer and Life Technologies

www.lifetechnologies.com who are pioneering fast consumer genomic sequencing are enabling this trend.

Learning 2.0

Education is not keeping pace with the demand for learning. Being competitive in the global economy is dependent on innovative learning and education. These are different. The process of learning must evolve fast. We cannot educate the way we did 100 years ago, yet we do. The explosion in learning given the terabytes of information that is now available from the digital revolution is essential to the future. This year new learning models, from online virtual learning in corporations and universities to even grade school will witness a new generation of students. Knowledge itself is exploding. Keeping up with the massive amount of information, new skills and learning that is required to compete in the global economy will demand new ways of learning.

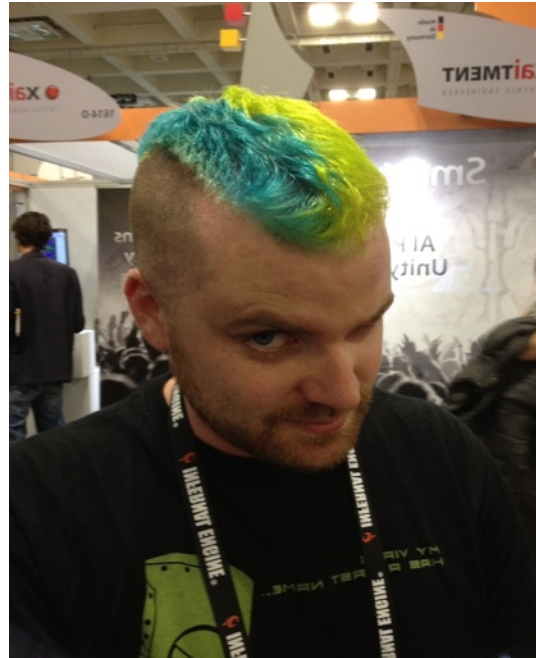


The impact of social media, mobile collaboration, interactive streaming collaboration is creating change in learning. The very learning model itself is under fire. Companies like AlvaEDU <http://www.alvaedu.com> will lead the way. We need to bridge the gap between learning demand and learning capacity. We need new ways to learn. Gamification, simulations, knowledge engineering, globalization, entrepreneurship, interactive and experiential learning are part of the new era of Learning 2.0.

Talent War

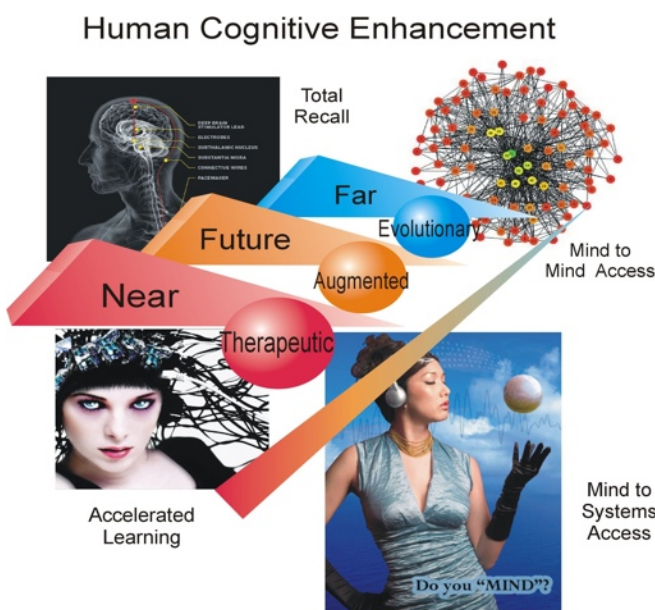
Forecasts and studies undertaken by IGF would indicate that there is a workforce trend that if not appreciated and planned for will damage every organization worldwide—the search for talent. The global talent market is best characterized by the power shift from organizations, the employers to the talent, the employees. There is more demand for smart, tech savvy, global talent than there is talent. More demand than supply. Every organization is in a pitched battle for talent.

Talent, the human resources that shape the destiny of every organization is in high demand. The right talent enables customers, creates the next innovation, brings in the next big contract and invents the product that will make or break your organization. Understanding the New Work Ethic that attracts and retains people will be the differentiator in this Talent War. Your future depends on getting this right and attracting a workforce that will make your organization Future-Ready.



Neuro-Enhancement

The U.S. National Institutes of Health estimate that the total number of U.S. residents with Alzheimer's in 2050 could reach 13.8 million, up from 4.7 million in 2010. The aging of the Baby Boomers has a dark scenario that if not addressed will become a global risk factor for humanity. That includes about 7 million people who would be age 85 or older in 2050. If you now multiply this number by five, to include the aging populations in Asia, especially China and Europe, given birth rates bringing population to 8 to 9 billion on the planet, you have both a forecast of at least 50 million people and a global epidemic of huge



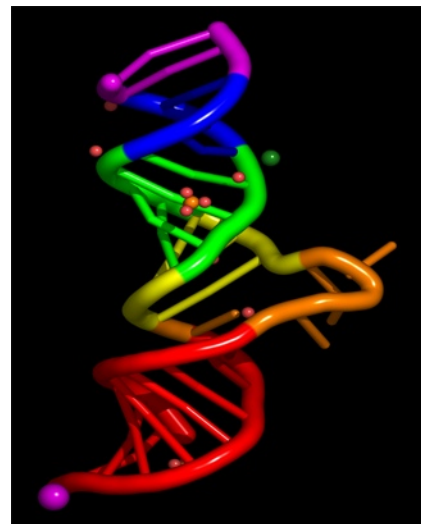
proportions.

The bottom line is worldwide we are not spending enough funding on research to invent a cure and the clock is ticking. We need a comprehensive neuro-enhancement research project that can refresh, prevent and heal the aging brain. New approaches in genomics, personalized medicine and regenerative medicine must be invested in heavily and accelerated. We need \$1 billion to defeat this fast growing epidemic.

Harnessing Big Data

Millions of data points are generated by customers and companies everyday that is never analyzed or even collected. A more intelligent examination of data collection, mining and analysis is coming fast. Embedded in this data deluge may well be new solutions for medicine, alternative energy, climate change, commerce, security, and crime. In fact, unlocking Big Data can be the single most important discovery tool in business.

Big Data refers to huge amount of data generated by companies, consumers, and markets and well, just about everyone leaves a data trail. Understanding how and what customers want is locked up in the data that goes for the most part unanalyzed. Big Data suggests an approach to better understanding how customer's demands and behaviors relate to the products and services they need. It gives us another way to understand the meaning of data.



Personal 3D Printing

3D printing is coming and it will change manufacturing perhaps creating a new distributed network of Makers. Last year we reported on the new manufacturing trend, the Makers Revolution. This year an evolution of this is worth mentioning. We will see the technology of the 3D printing industry creating organs, cars, instruments and industrial tools and parts emerging this year. 3D printing, the three-dimensional manufacture of almost anything industrial, may just disrupt traditional manufacturing.



Creating a distributed network of 3D printers that can deliver to the home or business manufactured products on-demand will both transform and revitalize manufacturing. From the CAD CAM computer design, to a finished manufactured product, 3D printing personalized for your needs, is coming fast. This year will see amazing progress as

the cost of 3D printers and the range of products—organs to cars will accelerate the product innovation, creating an entirely new industry—personal 3D printing.

Energy X

There is not enough energy to keep pace with global GDP by 2030. Expensive fossil fuel energy is a drag on economic growth and prosperity. Also the global warming associated with fossil fuels is now well established. We need Energy X, a new energy source that is clean, renewable and cheap. Energy is at the core of the sustainable future. So alternative energy experiments today that seem far-fetched may become the innovation drivers of the future.

The most audacious of these new innovations is fusion. Fusion energy is the power generated by nuclear fusion processes. In fusion reactions two light atomic nuclei fuse together. Fusion may become a plentiful, clean, and cheap new energy resource for the planet. Large fusion experiments in the U.S. (HiPER) and Europe (ITER), are accelerating the future when fusion may fuel the planet. Fusion an energy source once discredited is now back in research.



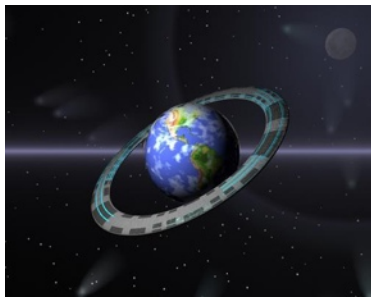
Promising results are emerging that could point the way to a new energy future. Even automobiles are undergoing a transformation. The internal combustion engine has competition. From hybrids to electrics, we are almost at a tipping point when it comes to thinking differently about transportation. As an example, Tesla www.teslamotors.com and 100% electric cars will be the start

of a new energy frontier. While shale and gas offer a clear alternative to foreign oil, they are not the only long-term solution that meets the test for clean alternatives. America is likely to be energy independent by 2025. Get ready for Energy X.

Quantum Computing Breaks Out

In every GFF forecast we offer an emerging area that is speculative but promising. Quantum computing, from bits to qubits, is the 2013 choice for what could change the world. The application of quantum physics is emerging. As we move into a world where cloud computing and everything will move up to the network we need a secure new computing architecture. Where existing computers are based on a linear basis, processing information sequentially, quantum computers may operate in a multidimensional way, offering vast new computing power.

Why would this be important? Think about creating an entirely new computing paradigm where secure, smart, fast and agile quantum computing networks play a fundamental role in finding planetary solutions for health care, energy, security, poverty, commerce, climate change, and finance. The Center for Quantum Science, University of Vienna and the Institute for Quantum Optics and Quantum Information are in the lead here. Are you ready for the Quantum Future?





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