# TOC Round 1

### China

#### China is hurting Mexican manufacturing now - the plan is key to revitalizing the industry and relations

Gallagher and Dussel 14- Kevin, Professor of International Relations at Boston University, Co-director of the Global Economic Governance Initiative, Enrique, Professor at the National Autonomous University of Mexico, Director of the Center for China-Mexico Studies (“How China crashed the Nafta party”, January 2, 2014 http://www.theguardian.com/global-development/poverty-matters/2014/jan/02/china-crashed-nafta-party-free-trade\\CLans

According to western tradition, the gift for the 20th anniversary of a union is china. But, two decades on from the trade nuptials enshrined in the the North American Free Trade Agreement (Nafta), China is the uninvited guest that has walked away with many of the gifts. In 1993, pro-Nafta Washington thinktanks, such as the Peterson Institute for International Economics, went so far as to say that the agreement would lead to a trade surplus with Mexico for the US, while also providing huge benefits for the Mexican economy. The US had a trade surplus with Mexico in 1994, but since 1995 the US has had an annual trade deficit with Mexico. On the Mexican side, GNI per capita economic growth is now barely one percentage point higher than when Nafta came into force. What has happened since then? Nafta has had at least two phases. In the first (1994-2000) it increased trade, investments, productivity and overall integration, with positive effects in employment and production in several export-oriented sectors in Mexico. In the second phase since 2000, however, Nafta turned sour. Its negotiators in the early 1990s did not anticipate the rise of Asia and particularly of China. Looking back, our research shows that China has significantly penetrated many of the new markets opened by Nafta. In a paper published by the Economic Commission for Latin America and the Caribbean, we document the extent to which Chinese products have taken away market share in the US, and how China has begun to take Mexican markets from the US as well. From 1994 to 2001, Mexico had a honeymoon with the US. No other country enjoyed the same proximity and trade preferences. Although trade increased significantly between the two countries, it failed to translate into per capita income growth and rising employment and wages in Mexico. The honeymoon ended in 2001 when China entered the World Trade Organisation and began to enjoy similar access to the US market. We find that by 2009, 84% of Mexico's manufacturing exports to the US were under threat from China. By threat we mean sectors where China is gaining market share and Mexico is losing it. We also find that 96% of US exports to Mexico are under threat from China. In 2000, the US supplied Mexico with 60.8% of its office machine and computer imports and 70% of the peripheral parts for those machines. Ten years later, the US held only 10% of the Mexican import market in each sector. By contrast, China held 13% of the office machine import market and 5% of the parts market in Mexico in 2000, and, nine years later, it had 48% and 58% of those markets respectively. Simple economics would lead one to think this would be a benefit for Mexico – as the inputs for its electronic industry decreased because imports from China are cheaper than from the US. This should lead to productivity gains and more exports to the States. China and Mexico supplied the US about 5% of the US computer market in 2000; by 2009 China had more than half that market and Mexico did not budge. We performed in-depth case studies alongside this statistical work that further confirm our findings. The yarn-textile-garment chain – similar to furniture, toys and most of Mexico's manufacturing sector – is symbolic in losing more than 50% of its employment since 2000. The US has become an additional loser, since it is the major supplier of Mexican exports. The automobile parts and assembly chain is a big exception in the competition with China, in the US market and in Mexico. Since the beginning of Nafta, Mexico's exports in the US have strengthened, with levels above 30%, while China's share has remained relatively low, mainly for domestic reasons: China's consumption in the auto sector has been dynamic and above its production, in other words the potential for exports has been low. This, however, will change as China's auto companies follow the lead set by other Chinese global multinationals. This is the hangover that will be felt long after the 20th anniversary party. The only remedy will be couples' therapy. From Mexico's vantage point the "Asia pivot" is seen as cheating on a partner. The region needs to revitalise its relationship: it is time to start a conversation about collective financing mechanisms, exchange-rate co-ordination, and strategic sectors for the Nafta region so it can negotiate and see itself as a larger block. That would give us something to celebrate.

#### Manufacturing offshoring now but investing in manufacturing is key to stop the trend and securing continual investment in North America

Minter 4/11- Steve, Writer for IndustryWeek, News Cite specializing in the advancement of the business of manufacturing, Citing Willy Shih, Harvard Business School Professor (“Manufacturing Innovation Bill Advances in Senate” http://www.industryweek.com/competitiveness/professor-shih-gives-manufacturing-renaissance-c?page=1\\CLans)

Willy Shih is still worried. Five years ago, the Harvard Business School professor and his colleague Gary Pisano wrote that “restoring the ability of enterprises to develop and manufacture high-technology products in America --is the only way the country can hope to pay down its enormous deficits and maintain, let alone raise, its citizens’ standard of living.” But when IndustryWeek asked Shih to assign a grade to our nation’s efforts to reverse the impact of decades of manufacturing offshoring and lost production capability, he answered, “C-.” Shih certainly isn’t all doom and gloom. He says there is much greater recognition of the problem now in Washington and among manufacturers than in 2009 when he and Pisano wrote “Restoring American Competitiveness” for the Harvard Business Review. “That’s very important progress,” he notes. “Until you recognize a problem, you don’t have much chance of addressing it.” He points to the promise by Walmart to source more merchandise from U.S. manufacturers as a positive sign. Walmart has pledged to spend $250 billion on U.S. products over the next 10 years. But Shih remains concerned that much of the recent improvement in manufacturing has not come from policy changes designed to make the U.S. a more attractive location for manufacturing but from changes in the economic environment that have made competitors less attractive. For example, wage inflation in China and wage stagnation in the U.S. has taken away some of the benefit of labor arbitrage. Another factor, he says, is the rising cost of transportation for manufacturers which has driven a transition from air to ocean freight and increased the amount of inventory in supply chain pipelines stretching from Asia to the U.S. That is causing some companies to bring manufacturing back to the U.S. or Mexico to serve the domestic market. Those trends have contributed to auto manufacturers such as Honda, BMW and Daimler increasing their footprint in the U.S. Manufacturing also has benefitted from the energy boom in the U.S. caused by fracking, turning the nation from an energy debtor to a leading oil and natural gas producer, and making the cost of energy much lower than for U.S. competitors in Japan and Europe. “We recall [in 2007] when GE sold off their plastics and engineered materials group to SABIC because we didn’t have the oil here and that is such a big component of the cost,” said Shih. Now, major chemical projects are underway or planned in the U.S. because it has become a low-cost source for feedstocks. While all this is consequential, says Shih, it has been a case of overseas locations becoming less attractive. He cautions, “Those negatives can turn relatively quickly.” Shih said some industries such as consumer electronics are likely gone from the U.S. He said the country needs to focus on industries that could be at risk. “We are still very strong in aerospace but we are coming up on a wave of retirements of a generation of aerospace workers,” he said. “Do we have the talent in the pipeline to maintain our strength there?” Shih is also concerned about the biotechnology manufacturing sector. There is a mentality among venture capital firms, he said, not to make these products but to have companies “get through phase 1 and phase 2 trials, monetize it, sell the company and let somebody offshore do it. That is not good for the long term.” Years of offshoring and outsourcing badly damaged the “industrial commons” in the U.S., Shih and Pisano warned in their HBR article and then in their 2012 book, “Producing Prosperity: Why America Needs a Manufacturing Renaissance.” The commons are the networks of suppliers of a vast range of products from production tooling to specialized components, the skilled workers, the engineers and academic researchers who all contribute to a vital manufacturing sector. “The idea of a commons transcends a cluster. The commons is the core capabilities in the supplier base like metalworking - castings, forgings, the ability to produce microstructure alloys,” Shih explains. “Some of them seem very ordinary but they are used by multiple industries.” When companies begin to outsource production, Shih and Pisano observed, it creates a snowball effect that eventually can cripple a manufacturing sector. “When a major player in an industry outsources an activity, cuts funding for long-term research and gains a short-term cost advantage, competitive pressure often forces rivals to follow suit,” they wrote in their HBR article. “As potential employment opportunities shrink, experienced people change jobs, moving out of the region, and students shy away from entering the field. Eventually, the commons loses a critical mass of work, skills and scientific knowledge and can no longer support providers of upstream and downstream activities…” Shih and Pisano argued that this outsourcing did more than reduce the U.S.’s ability to competitively manufacture advanced products such as laptop computers or advanced rechargeable batteries. They said it also damaged the nation’s capacity for developing new products and technologies because it failed to recognize the critical role of production in innovation. In many industries, Shih explained, important improvements in products come after the first prototype is developed. The interaction between designers and production personnel can help improve the manufacturability of the product as well as improve quality and lower cost. “It’s not just that the parts get cheaper,” said Shih. “It’s that I learn to do it better or I simplify the parts or get rid of parts that aren’t necessary. All of that requires a close interaction between the people who are building it and the people who designed the product.” Shih said as a manufacturer for 28 years, he appreciated the value of close ties between engineering and development, and the production floor. He spent the 1980s at IBM, where he recalls his manufacturing director being proud that the engineers were situated across the street from the manufacturing site in one case and just off the production floor at another. The value of this close linkage has been understood for decades, Shih said, with the Toyota Production System serving as an important lesson in its value. The counterargument has been that issues of distance could be overcome through telecommunications and flying people to China and other manufacturing sites. Shih said a generational gap has developed where manufacturing becomes a matter of purchasing components rather than making them. “There is very much a belief among many managers that if I design it, someone else can make it,” said Shih. “That fails to value how much of the overall product innovation actually happens in production.” Shih and Pisano have called for both government and industry to increase support of basic and applied research. Shih noted that government support of the human genome project, for example, had “catapulted the U.S. to world leadership in biotech.” He said the Obama administration’s efforts to develop a network of manufacturing innovation centers are on the right track. “I like what they are doing in terms of recognizing where the future is going such as with additive manufacturing,” Shih said, adding that the administration was taking a “thoughtful approach” to identifying important emerging technologies and supporting early stage research. He noted that companies shy away from such investments because the risk they won’t capture a return on their investment is too high. He said he agreed with many economists that the government should invest in these “long-term, R&D public goods” and then let the market commercialize technologies and determine winners and losers. But Shih said Washington has failed to tackle major issues such as taxes and regulations which are inhibiting the growth of manufacturing in the U.S.

#### Foreign investment is key to evolve factories technologically—

Rapiey ‘11 Stanley Joseph Rapiey, Department of Defense Civilian “Maquiladoras and National Security: Design Theory as a Guide.” 25, October, 2011

A third challenge associated with this system concerns the lack of complexity of the production performed by the maquiladoras. The vast majority of maquiladoras conduct simple assembly, so the factories involved are tooled for basic production, and the employees only have basic skills. This drastically limits the ability of both the factories and their employees to adjust to new forms of production as the maquiladoras fall to foreign competitors. This industry is so tightly tied to specific customers in the U.S. that a transition to some other form of production would require massive changes in structure and labor. The Mexican government understands this as a problem and seeks to drive the evolution of so-called “first generation” maquiladoras to second and third generation models. The first generation maquiladoras are the least complex and simply assemble raw materials. Foreign investment brings with it technology, and, with this technology, the maquiladoras evolve into more complex factories that eventually focus less on labor intensity and more on more sophisticated products, R&D and even product design.39 Unfortunately, there are few examples of this trend, and many critics complain that the entire concept of the maquiladora “traps developing countries into the deadend role of providing cheap labor for low value-added assembly operations.”40

#### Collapse threatens national security—altering engagement policy is critical to sustain it

Rapiey ‘11 Stanley Joseph Rapiey, Department of Defense Civilian “Maquiladoras and National Security: Design Theory as a Guide.” 25, October, 2011 [MG]

The Mexican maquiladora industry is rapidly losing market share to Asian competitors that dramatically undercut them in terms of labor cost. The decline of these assembly-for-export factories will result in instability along the U.S.-Mexico border and will prove to be a serious national security issue for the United States. This paper leverages Design theory to frame the problems surrounding Mexico’s maquiladora industry in order to develop an understanding of this complex adaptive system. It examines the wide range of actors involved in the system, focusing on their goals, motivations and conflicting tendencies. Finally, the paper recommends courses of action for U.S. and Mexican leaders that will mitigate the resulting instability in the Mexican northern border states. The economic stability of Mexico will always be a national security priority for the United States. The two nations share a border of nearly 2,000 miles, and trade between them is worth billions of dollars. To take advantage of this relationship, the Mexican government created a series of customs and trade policies specifically designed to enhance its economic ties to the U.S. For decades, such policies greatly benefited Mexico’s maquiladoras, factories that import raw materials, rapidly combine them into finished products, and export them to the American market. Unfortunately for Mexico, the strong advantages in low-cost labor and speedy delivery are gradually being eroded by similar programs in China and Southeast Asia. As U.S. companies look to Asia for more profitable business relationships, the Mexican government has done little to alter its customs and trade policies in response. A severe economic blow to the maquiladoras along the U.S. border would have dramatic effects on the stability of the area, affecting both Mexican and American national security interests. The governments of Mexico and the United States should therefore take preemptive measures to mitigate the instability that is arising as the maquiladoras lose their viability under new global economic pressures. These measures include altering customs and trade policies, providing economic incentives in order to transform the Mexican export industry, and creating labor opportunities for Mexicans within the United States. In order to support this thesis, the following paper will leverage Design Theory to examine the current situation in the Mexican maquiladora industry, identify problems in terms of potential impacts to U.S. national security, and propose possible courses of action for both American and Mexican decision-makers.

#### This threatens the entire relationship and causes industries to shift toward China—

Rapiey ‘11 Stanley Joseph Rapiey, Department of Defense Civilian “Maquiladoras and National Security: Design Theory as a Guide.” 25, October, 2011

The Problem Frame highlights the issues that must be addressed in order to transform current conditions into the desired end state.25 In this case, the desired end state is a more stable economy in the northern Mexican states, free from the current stress brought about by the decline in the maquiladora industry. Since 60% of Mexican maquiladoras operate in the border states, this end state is a key factor in the stability of the border area for both the United States and Mexico.26 Additionally, 80% of all Mexican exports are to the United States, making this relationship extremely important.27 It is in the best interest of these nations to take action to reach this end state. In order to develop future courses of action that create conditions conducive for the desired end state, the current challenges that currently exist in this system must be examined. The three major challenges to reaching the desired end state are connected to flaws in the Mexican export industry, specifically its inability to respond to global competition, its overreliance on the American market, and its lack of complexity. A fourth challenge is connected to the free flow of labor in this region. These challenges are obstacles in the path to a stable and secure northern Mexico. First of all, Mexico’s response to increased competition for its maquiladoras has been completely inadequate. Over the past decade, China has presented an attractive alternative to Mexican maquiladoras in terms of labor costs. In 2008, Chinese hourly manufacturing wages were estimated nearly 75% cheaper than those in Mexico.28 For over a decade, Chinese factories have been able to assemble goods of equal quality as the maquiladoras, but now they can provide greater quality control and better physical infrastructure.29 As drug violence continues in Mexico, security has become a greater decision point for businesses as well, and many are concerned that investing in Mexico is a risk.30 Mexico’s two main responses to this situation have been extremely inadequate and have not improved the overall situation. The Mexican government’s first response was to escalate anti-Chinese rhetoric, even working to delay China’s entry into the World Trade Organization.31 This merely delayed the inevitable and resolved nothing. Later, driven by the need to compete with China, Mexican factories laid off personnel and cut worker salaries in order to reduce labor costs.32 Considering the weak global economy, this unfortunate move added pressure to an already-stressed workforce. The resultant increases in unemployment and underemployment, combined with reduced salaries, will increase instability in the region as people are driven to crime, either as victims or participants.33

#### US reliance on Chinese technology for military purposes undermines its capability and allows for Chinese espionage

Snyder 5/29/13 – (Michael, “Why The Next War With China Could Go Very Badly For The United States”, http://www.infowars.com/why-the-next-war-with-china-could-go-very-badly-for-the-united-states/)//javi

Another way that China is gaining a strategic advantage over the U.S. is by getting the U.S. military to become increasingly dependent upon them. According to Forbes, now the U.S. military is even leasing a Chinese satellite for communications purposes… American dependence on China grows by the day. The latestnews is that the United States has been reduced to leasing a Chinese satellite to handle communications with U.S. military bases in Africa. Surprising, isn’t it? The nation that launched the world’s first communications satellite (I remember it well – it was called Telstar) has so lost its manufacturing mojo that it has to rely on its most formidable military adversary to provide the hardware for some of its most sensitive communications. This at a time when underlying unemployment rates among U.S. manufacturing workers remain at near-depression levels. Isn’t that crazy? And a recent Senate report discovered that many of our most advanced weapons systems are absolutely riddled with counterfeit Chinese parts… A recent Senate report, titled Inquiry Into Counterfeit Electronic Parts In The Department Of Defense Supply Chain, “uncovered overwhelming evidence of large numbers of counterfeit parts making their way into critical defense systems.” The investigation found 1,800 cases of counterfeit electronic parts involving over one million suspect parts in 2009-10 alone, thereby exposing “a defense supply chain that relies on hundreds of unveiled independent distributors to supply electronic parts for some of our most sensitive systems.” The report concluded, among other things, that China is the “dominant source” of counterfeit products that enter the DoD supply chain, that the Chinese government does little to stop it and that the DoD doesn’t know the “scope and impact” of these parts on critical defense systems. Who in the world would be stupid enough to allow one of their greatest strategic enemies to supply large numbers of parts for key weapons systems? Apparently we are that stupid. Things are particularly bad when it comes to semiconductors… Senator John McCain commented: “We can’t tolerate the risk of a ballistic missile interceptor failing to hit its target, a helicopter pilot unable to fire his missiles, or any other mission failure because of a counterfeit part.” Calling the issue “a ticking time bomb,” Brian Toohey, president of the Semiconductor Industry Association, commented: “The catastrophic failure risk inherently found in counterfeit semiconductors places our citizens and military personnel in unreasonable peril.” It would be bad enough if we just had to worry about counterfeit parts failing. But what if China has a way to shut some of those parts down in the event of a conflict? What if some of those parts contain “Trojan Horse” computer chips or malware? That may sound crazy, but unfortunately Trojan Horse chips can be extremely difficult to detect. The following is from a recent Forbes article… As the Defense Science Board pointed out, Trojan Horse circuitry is almost impossible to detect even with the most rigorous analysis. This is particularly so if a saboteur can accomplish matching subversions in both software and relevant hardware.

#### Chinese espionage is the biggest internal link to Chinese military modernization

U.S.-China ESRC 7 – U.S.-China Economic and Security Review Commission[Report to Congress-The Commission was made up of members of the 110th Congress, 1st Session, November, <http://www.uscc.gov/annual_report/2007/report_to_congress.pdf>
The pace and success of China’s military modernization continue to exceed U.S. government estimates. Indeed, on occasion the U.S. defense and intelligence communities have been taken by surprise, 7 as in the case of the launching of the Jin class submarine by the navy of the People’s Liberation Army. China’s defense industry is producing new generations of weapon platforms with impressive speed and quality, and these advancements are due in part to the highly effective manner in which Chinese defense companies are integrating commercial technologies into military systems. Additionally, industrial espionage provides Chinese companies an added source of new technology without the necessity of investing time or money to perform research. Chinese espionage in the United States, which now comprises the single greatest threat to U.S. technology, is straining the U.S. counterintelligence establishment. This illicit activity significantly contributes to China’s military modernization and acquisition of new capabilities.

#### US can no longer win the war due to Chinese tech advancement through espionage

Snyder 5/29/13 – (Michael, “Why The Next War With China Could Go Very Badly For The United States”, http://www.infowars.com/why-the-next-war-with-china-could-go-very-badly-for-the-united-states/)//javi

Most Americans assume that the U.S. military is so vastly superior to everyone else that no other nation would ever dream of fighting a full-scale war against us. Unfortunately, that assumption is dead wrong. In recent years, the once mammoth technological gap between the U.S. military and the Chinese military has been closing at a frightening pace. China has been accomplishing this by brazenly stealing our technology and hacking into our computer systems. The Pentagon and the Obama administration know all about this, but they don’t do anything about it. Perhaps the fact that China owns about a trillion dollars of our national debt has something to do with that. In any event, today China has the largest military in the world and the second largest military budget in the world. They have stolen plans for our most advanced jets, helicopters, ships and missile systems. It is estimated that stealing our technology has saved China about 25 years of research and development. In addition, China is rapidly developing a new generation of strategic weapons that could potentially enable it to actually win a future war against the United States. At one time such a notion would have been unthinkable, but as you will see below, the next war with China could go very badly for the United States.

#### Chinese military modernization causes great power war

Twomey 9, co-directs the Center for Contemporary Conflict and is an assistant professor in the Department of National Security Affairs, both @ the Naval Postgraduate School in Monterey, CA, 9 [Christopher, Arms Control Association, “Chinese-U.S. Strategic Affairs: Dangerous Dynamism, http://www.armscontrol.org/act/2009\_01-02/china\_us\_dangerous\_dynamism#Twomey]

China and the United States are not in a strategic weapons arms race. Nonetheless, their modernization and sizing decisions increasingly are framed with the other in mind. Nuclear weapons are at the core of this interlocking pattern of development. In particular, China is the only permanent member of the UN Security Council expanding its arsenal; it is also enhancing its arsenal. The basic facts of Chinese strategic modernization are well known, if the details remain frustratingly opaque. China is deploying road-mobile, solid-fueled missiles, giving it a heighted degree of security in its second-strike capability. It is beginning to deploy ballistic missile submarines (SSBNs). It is researching a wide range of warhead and delivery systems technologies that will lead to increased accuracy and, more pointedly, increased penetration against ballistic missile defenses. The size of China's deliverable arsenal against the United States will undoubtedly increase beyond the few dozen that it possessed recently.[1] The pace of growth thus far has been moderate, although China has only recently developed reliable, survivable delivery systems. The final endpoint remains mired in opacity and uncertainty, although several score of deliverable warheads seems likely for the near term. These developments on the strategic side are coupled with elements of conventional modernization that impinge on the strategic balance.[2] The relevant issue, however, is not simply an evaluation of the Chinese modernization program, but rather an evaluation of the interaction of that modernization with U.S. capabilities and interests. U.S. capabilities are also changing. Under the provisions of START and SORT, the United States has continued to engage in quantitative reductions of its operational nuclear arsenal. At the same, there is ongoing updating of warhead guidance and fusing systems. Ballistic missile defense systems of a variety of footprints are being deployed. The U.S. SSBN force now leans more toward the Pacific than the Atlantic, reversing the Cold War deployment. Guam's capacity to support heavy bombers and attack submarines has been enhanced. Furthermore, advances in U.S. conventional weaponry have been so substantial that they too promise strategic effects: prompt global strike holds out the promise of a U.S. weapon on target anywhere in the world in less than an hour and B-2s with highly accurate weapons can sustain strategic effects over a campaign. What are the concerns posed by these two programs of dynamic strategic arsenals? Most centrally, the development of the strategic forces detailed above has increasingly assumed an interlocked form. The U.S. revolution in precision guided munitions was followed by an emphasis on mobility in the Chinese missile force. U.S. missile defense systems have clearly spurred an emphasis on countermeasures in China's ICBM force and quantitative buildups in its regional missile arsenals.[3] Beijing's new submarine-based forces further enhance the security of China's second-strike capability in the face of a potential U.S. strike but are likely to lead to increased attention to anti-submarine warfare in the United States. China's recent anti-satellite test provoked a U.S. demonstration of similar capabilities. Such reciprocal responses have the potential to move toward a tightly coupled arms race and certainly have already worsened threat perceptions on each side. The potential for conflict is not simply that of inadvertent escalation; there are conflicts of interests between the two. Heightening threat perceptions in that context greatly complicates diplomacy. Further, the dangers of inadvertent escalation have been exacerbated by some of these moves. Chinese SSBN deployment will stress an untested command-and-control system. Similar dangers in the Cold War were mitigated, although not entirely overcome, over a period of decades of development of personnel and technical solutions. China appears to have few such controls in place today. U.S. deployment of highly accurate nuclear warheads is consistent with a first-strike doctrine and seems sized for threats larger than "rogue" nations. These too would undermine stability in an intense crisis.

#### Recent disputes with China increase the probability of miscalculation – absent force – China will unilaterally intervene in Asia

Max Hastings 1/2/14 [educated at Charterhouse School and University College, Oxford, British journalist, editor, historian and author, “Is World War Three about to start... by accident? Max Hastings asks whether rising tensions between China and Japan could boil over”,http://www.dailymail.co.uk/news/article-2532932/Is-World-War-Three-start-accident-Max-Hastings-asks-rising-tensions-China-Japan-boil-over.html, ML]

If conflict does come, it will be waged with the high-tech weapons of our own time: warplanes manned and unmanned, missiles, cyber-attack weapons and the many instruments of destruction guided from space satellites. But this would not make a great power conflict any less catastrophic. And this is why a shiver will have run through the leaderships of Asia and of the Western powers this week when China's ambassador to London argued that Japan risks 'a serious threat to global peace' by 'rekindling' the bellicose attitude that hastened the expansion of World War II into a global conflict. He even compared Japan today to Lord Voldemort, the arch villain in the Harry Potter novels. This comes just a few weeks after China — with absolutely no warning — declared hundreds of thousands of square miles of airspace above the East China Sea as its own Air Defence Zone. This includes the eight tiny uninhabited pimples, called the Senkaku Islands by Japan and Diaoyu by China. Taiwan also has a claim to the islands — nationalised by Japan from private sellers in 2012, much to the anger of China. The United States responded to this bitter dispute between Tokyo and Beijing by dispatching two USAAF B-52s bombers to overfly the islands, emphasising its commitment to the right of free navigation. Japan's prime minister, Shinzo Abe, declared gravely that China had started 'a whole new game'. His government threatened to shoot down any Chinese drones that appeared over the Senkakus. Beijing responded that this would be an act of war. Nobody, including the Chinese, wants armed conflict. Indeed, an analyst for the International Institute Of Strategic Studies has said that China 'aims to push rather than break limits'. Yet the tensions between Tokyo, Washington and Beijing have been increasing for years. For the moment, China, the U.S. and Japan still maintain courtesies between governments. Most crucially, Beijing holds trillions of dollars of U.S. debt. But many of history's wars have been triggered by miscalculations while nations have been testing each other's strengths. Indeed, there is a profound fear in Washington, in Tokyo, and maybe also in Beijing, that one day something unspeakably ghastly could happen by mistake. Remember that in 1914 before the outbreak of World War I, Britain and Germany were each other's largest trading partners. Professor Peter Dutton, of the U.S. Naval War College, has warned of the growing tensions, saying: 'China's challenge to existing maritime norms is creating hairline fractures in the global order.' This comment followed an authoritative Washington defence guru who said that, whatever short-term bother terror groups such as Al Qaeda might cause, 'in the middle-long term, there will only be one main concern of the U.S. armed forces, and that is China. China is reshaping the military order in Asia, and is doing so at our expense'. China has an ever-growing fleet of missile-armed warships — thought to number around 80, as well as nearly 300 amphibious assault ships — including fast-attack craft specifically designed as 'carrier-killers', to engage the U.S. Navy's behemoths. In response, the huge U.S. Andersen air force base on the Pacific Ocean island of Guam has become host to a £10 billion reinforcement programme. As a result, its hangars now hold B-2 and B-52 bombers, air-to-surface and cruise missiles, Global Hawk drones, F-15 and F-22 fighters, the latter just a 20-minute flight from the Taiwan Strait. Amitai Etzioni, professor of international relations at George Washington University, declares bleakly: 'There are increasing signs that the United States and China are on a collision course.' What is not disputed is that China is determined to assert its new status as a major regional power, while the U.S. is equally bent upon deterring or deflecting Chinese expansionism, and especially aggressiveness. This was the reason behind President Obama's 2010 decision to rebalance American strategic assets towards the Pacific. The American case is as readily made as was the British one, for resisting quite similar German posturing before 1914. Washington's attitude is: 'We and our allies are democracies, while China is an autocracy which denies respect for human rights or international law.' I believe that unless the Washington administration makes plain its determination to support any country (such as Japan) that is threatened with aggression by Beijing, China will go ahead and impose its ruthless will upon the entire Pacific region. As for the contrary view from Beijing itself, China's leaders cherish a profound grievance about the Tokyo government's persistent refusal to confront the reality of Japan's mid-20th century war crimes in Asia. For the Tokyo government asserts that the time has passed for any Japanese apologies or even discussion of its historical record. An example of this defiance is the military museum that is situated next door to Tokyo's Yasakuni shrine, where so many Japanese war criminals' ashes lie and to which many Japanese politicians visit to pay homage. I have been to the place myself, and find it as repugnant as do the Chinese. Which is why they found such offence a few days ago when the Japanese premier arrived there to pay his respects. (Its choice of exhibits is intended to prove that during the middle of the last century, Japan entered China — where at least 15 million people fell victim to its occupation — and other Asian countries in order to 'protect' them from European exploitation.) In the same vein, Japan describes its half-century occupation of Korea as a 'partnership'. The ghastly Thirties massacres committed by the Japanese army at Shanghai and Nanjing are not mentioned. In Japanese school textbooks, the systemic exploitation of 'comfort women' by the Japanese Army is a forbidden subject. Most shockingly, a Japanese minister claimed last year that such victims were 'volunteers'. While it is deemed unforgivable — and even criminal — across most of the world to deny the existence of the Nazi Holocaust of six million Jews, almost the entire Japanese nation denies its own barbarities across Asia. This intransigence helps to explain why South Korea, for instance, recently refused to conclude an intelligence-sharing security agreement with Japan, because public opinion remains so alienated by its former oppressors' lies about the past. For its part, the U.S. is impatient for Japan to abandon the controversial Article 9 of its post-war constitution (imposed by America after the end of World War II), which forces the country to renounce war and restricts its armed forces to a self-defence role. Times have changed and Washington now wants to see the Japanese accept a much larger share of the responsibility for containing China. But more than a few prominent Asians are wagging a warning finger at the Americans, urging: 'Be careful what you wish for.' The truth is that many of Japan's Asian neighbours — not to mention the Chinese — will never trust Tokyo until it comes clean about its dreadful history, as it seems determined not to do. China is a tough, assertive, immature nation in a hurry; the United States is seen in Beijing as a weakly led, declining military power that is vulnerable to pressure On the specific issue of the disputed Senkaku islands, China points out that Tokyo has held them only since the late 19th century, when Japan became an early entrant into the race for an Asian empire. There are economic issues at stake, too. Sovereignty claims are based on a desire to exploit the area's rich resources in fish and hydrocarbons. Above all, though, the tension is based on much bigger ambitions. China argues, just as Germany did before 1914 in respect of Britain's maritime supremacy, that now it is one of the big players in Asia, there is no reason why it should accept America's claims to Pacific hegemony. Why should Beijing tolerate U.S. warships and aircraft conducting close surveillance of the Chinese coast? Such a presence is unjustified in an age of satellites and simply reflects a wish by America to parade its military might at the expense of Chinese dignity. Such arguments have spread to cover debate about freedom of the internet. A Chinese army general recently dismissed American drum-banging about the importance of preserving 'global internet freedom.' He said that Washington was using this as an excuse to preserve its own 'cyber-hegemony'. He added: 'In the information era, seizing and maintaining superiority in cyberspace is more important than was seizing command of the sea and air in World War II'. Even if we British, as American allies, ultimately reject some of these arguments, we should acknowledge that the U.S. often seems clumsy, patronising and over-bearing in its attitude to other nations. For example, the Chinese were enraged recently by the behaviour of U.S. Vice-President Joe Biden. On a supposed goodwill visit to Beijing, he urged a group of Chinese to keep up their protests against denial of human rights. He said they should 'challenge the government'. Biden may have been right, but his action was foolish and insensitive. Such self-righteous moralising is the sort of behaviour that worries Nigel Inkster, a former deputy director of Britain's Secret Intelligence Service, who, earlier this year, spoke bleakly about the relationship between the two countries. He said: 'If it is to avoid becoming the chronicle of a death foretold, both parties will need to demonstrate greater self-awareness than either has yet shown'. A key issue of contention remains human rights. Of course, it is right that the rest of the world presses China to respect international law abroad and human rights at home. Military power, firmness and clarity of purpose are essential tools for addressing China through the years ahead, as it increasingly flexes its muscles. But so, too, is a willingness to recognise that China will not become a liberal democracy any time soon. As this vast country has for centuries been so misused by the Western powers, including Britain, its rise to greatness now deserves applause as well as prudent apprehension. Yet, however careful the U.S. and China may be in managing their future relationship, I fear that it will remain fraught and indeed dangerous. China is a newly rich, increasingly mighty nation, which is bent upon elbowing aside the Americans, in the Pacific region at least, to assert its own claims as a Great Power. This makes it inevitable that there will be rows, confrontations, crises, some involving both nations' armed forces. The peril will persist throughout our lifetimes and the great worry is that a clash such as one over the disputed Senkaku islands will go horribly wrong. Popular nationalism is a growing force in China, just as it is in Japan, and the great challenge for both nations' politicians is to grapple with its excesses. China often speaks of the importance of using restraint — kezhi — in its conduct abroad. But its defence minister has said that although any full-scale war is unlikely, 'we cannot exclude the possibility that, in some local area, unexpected events may occur, or military friction may take place due a to a misfire'. History tells us that nations that create vastly expensive armed forces sooner or later feel an itch to use them. China is a tough, assertive, immature nation in a hurry; the United States is seen in Beijing as a weakly led, declining military power that is vulnerable to pressure. For the moment, Washington knows that it can deploy vaster greater military power than China. It is also morbidly anxious not to be seen to show weakness — hence its decision to dispatch the B-52s over the Senkakus. Ultimately, I want to be hopeful. The world managed to avert war during more than 40 years of armed nuclear confrontation between the Soviet Union and the United States. Maybe it can do so through the 21st century, as China grows ever stronger and America's superiority wanes. But we cannot take peace for granted. The Pacific rim is ever more densely strewn with the toys of war. The risk of some local turf dispute exploding into a great power collision will remain alarmingly real.

### Plan

#### The United States federal government ought to offer financial assistance toward the assembly-for-export industry in Mexico.

### ADV 2

#### Manufacturing drives innovation and pharmaceutical industry

Swezey 11 (Devon Swezey, Project Director for Breakthrough Institute where he works as an energy and climate policy analyst and Ryan McConaghy, pg online @ <http://thebreakthrough.org/blog/BTI_Third_Way_Idea_Brief_-_Manufacturing_Growth_.pdf>)

New manufacturing thrives on and drives innovation. Manufacturing is a core component of the nation’s innovation ecosystem. Firms engaged in manufacturing re-invest a significant portion of revenues in research and development (R&D). Overall, the manufacturing sector comprises two-thirds 9 of industry investment in R&D and employs nearly 64% of the country’s scientists and engineers. 10 Manufacturers also have unique opportunities to apply new technologies for specialized functions and achieve economies of scale at the plant or firm, 11 making the return on manufacturing R&D significant. The transition to advanced manufacturing will enhance the sector’s role in fostering innovation and developing and commercializing new technologies. Advanced manufacturing industries, including semiconductors, computers, pharmaceuticals, clean energy technologies, and nanotechnology, play an outsized role in generating the new technologies, products, and processes that drive economic growth. Advanced manufacturing is also characterized by the rapid transfer of science and technology into manufacturing processes and products, which in and of itself drives innovation. The research-to-manufacturing process is cyclical, with multiple feedbacks between basic R&D, pre-competitive research, prototyping, product development, and manufacturing. This opens new possibilities for product development and manufacturing. 12

#### Mexican pharmaceuticals are key

NAPS 4/11/13 (North American Production Sharing Incorporated, <http://www.napsintl.com/news/index.php/2013/04/11/the-medical-device-industry-manufacturing-in-mexico-has-a-clean-bill-of-health/>)

[Medical device](http://www.napsintl.com/medicaldevice.php) companies manufacturing in Mexico continue to exhibit steady growth with no sign of a slow down in sight. As costs in the United States and Eastern Europe continue to rise, especially with the implementation of “Obamacare” and its direct impact on medical device companies, more organizations are considering [manufacturing in Mexico](http://www.napsintl.com/manufacturinginmexico.php) as a viable solution. No other place in Mexico is this more evident than in Tijuana, where they now claim the largest concentration of medical device companies in all of North America. The ability to provide both timely deliveries and consistently high quality products are a few reasons why medical device manufacturers are choosing Mexico. Also, there is a tremendous base of talented labor with experience in medical device, [automotive](http://www.napsintl.com/auto.php), electronics, aerospace and other sophisticated industries to support the growth of manufacturing in Mexico. Furthermore, the labor laws in Mexico provide companies much more flexibility in terms of compensation, scheduling and seasonality, which plays an important roll on profitability. Another factor drawing medical device manufacturers to Mexico is the government’s enforcement, and employee’s respect, for intellectual property. Unlike many other low-cost manufacturing countries, Mexico is known for its low piracy rates, which cost companies billions of dollars a year. One of the challenges facing these companies is understanding the business landscape and culture in Mexico, which is why many of these firms are choosing to outsource their administration and compliance management to shelter companies. A good shelter company will handle 100% of the administration, including Humyn Resources in Mexico, Payroll in Mexico, Accounting in Mexico, Import/Export in Mexico and Environmental, Health & Safety in Mexico, allowing the manufacturer to focus on production and quality control. “We are receiving a record number of inquires from medical device manufacturers around the world who want to explore Mexico as a competitive solution,” said Scott Stanley, Sr. Vice President of North American Production Sharing, Inc. (NAPS), Tijuana’s largest and most sophisticated shelter service provider. “NAPS guides these companies through the process of feasibility by providing all the facts and figures about expanding into Mexico so sound business decisions can be made. Thereafter, we essentially become partners and typically work together for many years.” With an increase in demand for medical device products, not only in the United States but also within Mexico’s public health sector, Mexico will continue to be the primary choice for medical device manufacturing.

#### **Pharmaceutical advancements solve disease**

Dana-Farber, 2002 [Since its founding in 1947, Dana-Farber has been committed to providing cancer patients with the best treatment available today while developing tomorrow's cures through cutting-edge research. Research into rare disease leads to discovery of six new breast cancer-susceptibility genes, June 13, http://www.dana-farber.org/abo/news/press/061302b.asp]

**A decade of research into one of the world's least-known diseases has resulted in a major advance against one of the best-known:** the discovery of six genes linked to inherited breast **cancer.** In a study published online by the journal Science on June 13, investigators at Dana-Farber Cancer Institute and Children's Hospital Boston report that an error in any of the half-dozen genes involved in Fanconi anemia - a rare childhood condition - can increase an individual's chances of developing breast cancer. **The discovery raises the prospect that the ranks of known breast cancer-susceptibility genes -** best known as BRCA1 and BRCA2 **- will soon increase four-fold,** to a total of eight. "Just as women today can be tested for BRCA1 and BRCA2 mutations to determine if they have an inherited predisposition for breast cancer, testing for mutations in these other six genes may soon become a routine part of gauging inherited breast cancer risk," says the study's senior author, Alan D'Andrea, MD, of Dana-Farber. **"Women and their doctors can then use the information in deciding how to keep that risk at a minimum." The finding may also spur the development of new treatments capable of preventing or quelling breast cancer in women at risk for the disease. Drugs that can counteract the flaws in specific genes promise to be more effective than therapies that take a more generic approach.** The discovery of the new cancer-susceptibility genes grew out of more than 10 years of research by D'Andrea into Fanconi anemia, a condition known to affect only 500 families in the United States. Children born with the condition usually develop bone marrow failure early in life, leaving them unable to produce oxygen-carrying red blood cells. If they survive into young adulthood - often with the help of a bone marrow transplant - they're at risk for a variety of cancers - most often leukemia, but also tumors of the brain, head and neck, breast, colon, and other parts of the body**. "This work is a prime example of how research into rare conditions can lead to better diagnosis and treatment for people with far more common diseases,"** D'Andrea explains.

#### H5N1 and other deadly pathogens will escape from BSL-4 labs—the impact is extinction**Wilson 13** (Grant Wilson, J.D. from the Lewis and Clark Law School, has worked on international law issues and emerging technologies specifically in Mexico, Professional Associate at the Global Catastrophic Risk Institute, a nonprofit think tank that engages in research, education, and professional networking in areas related to global catastrophic risks, “Minimizing Global Catastrophic and Existential Risks from Emerging Technologies through International Law “ <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2179094>,)

An accidental release of a bioengineered microorganism during legitimate research poses a GCR/ER when such a microorganism has the potential to be highly deadly and has never been tested in an uncontrolled environment. The threat of an accidental release of a harmful organism recently sparked an unprecedented scientific debate amongst policymakers, scientists, and the general public in reaction to the creation of an airborne strain of H5N1. In September 2011, Ron Fouchier, a scientist from the Netherlands, announced that he had genetically engineered the H5N1 virus—his lab “mutated the hell out of H5N1,” he professed—to become airborne, which was tested on ferrets; a laboratory at the University of Wisconsin-Madison similarly mutated the virus into a highly transmittable form. The “natural” H5N1 killed approximately sixty percent of those with reported infections (although the large amount of unreported cases means that this is an over estimate), but the total number of fatalities—346 people—was relatively small because the virus is difficult to transmit from human to human. The larger risk comes from the possibility that a mutated virus would spread more easily amongst humans, which could result in a devastating flu pandemic amongst the worst in history, if not the very worst. To put this in context, about one in every fifteen Americans—20 million people—would die every year from a seasonal flu as virulent as a highly transmittable form of H5N1. Lax regulations and a rapidly growing number of laboratories exacerbate the dangers posed by bioengineered organisms. While lab biosafety guidelines in the United States and Europe recommended that projects like reengineering the H5N1 virus be conducted in a BSL-4 facility (the highest security level), neither laboratory that reengineered the H5N1 virus met this non-binding standard. Meanwhile, a 2007 Government Accountability Office (“GAO”) report indicated that BSL-3 and BSL-4 labs are rapidly expanding in the United States. While there is significant public information about laboratories that receive federal funding or are registered with the Centers for Disease Control and Prevention (“CDC”) and the U.S. Department of Agriculture’s (“USD”) Select Agent Program, much less is known about the “location, activities, and ownership” of labs that are not federally funded and not registered with the CDC or the USD Select Agent Program. The same report also concluded that no single U.S. agency is responsible for tracking and assessing the risks of labs engaging in bioengineering.

#### Mexico is key – the US can’t solve

Bañuelos et al 12 (Carlos Guzmán Bofill, Ana María Rivas Llamas, Carlos Casas Guerrero, Juan Ángel Vargas Plata, Juan Carlos Téllez Girón Barrón, Luis Anthony Olivé Hawley, Sebastián Escalante Bañuelos, Natalia Herrero Martínez, Izael Mijangos González, June, http://www.promexico.gob.mx/work/models/promexico/Resource/1985/1/images/Aerospace\_CHIHUAHUA\_ENG.pdf)

The United States our major commercial partner is going through a talent crisis due to a lack of engineering graduates, added to constant cuts in defense spending, which complicates the upkeep of its current abilities to research, develop and produce defense and high-tech dual-use items. Mexico has more engineering graduates per capita than the United States and skilled and engineering labor costs are more competitive in Mexico; the technological sophistication of its manufactured goods is above that of BRIC countries such as India and Brazil. These three factors make Mexico the best answer to the issues that affect the United States. The creation of the SCE and Mexico’s acceptance into the WA have laid the foundation to guarantee national surveillance during the export of restricted and dual-use technologies and goods. According to conservative estimates, the WA will enable the national industry to access a potential high-technology export market of close to an additional 11.3 billion dollars per year, added to the potential creation of between 30 and 40 thousand highly paid jobs in the next five years.7 Chihuahua’s advanced manufacturing vocation (landing gears, fuselages, engines, harnesses and precision machining) make it the ideal destination for projects in the A+D cluster. Furthermore, the Federal Government is in negotiations with the US Department of Defense to develop a regional aerospace and defense manufacturing block focused on Buy NAFTA. This could be completed with the signing of a MoU between the US Department of State and the Ministry of National Defense (SEDENA)

#### Mexico is key to cloud computing and semiconductors

Maquila Portal 13- Mexico Manufacturing Industry Information Agency providing national coverage and daily updates on manufacturing industries in Mexico (“Principal Mexico Manufacturing Clusters in Ciudad Juarez”, July 2, 2013 http://www.maquilaportal.com/index.php/blog/show/Principal-Mexico-Manufacturing-Clusters-in-Ciudad-Juarez.html\\CLans)

In Ciudad Juárez, the maquiladora manufacturing industry has played a vital role in technology transfer and development of the local economy. As industry began to appear on the U.S.-Mexico border in the 1960s, Juárez came to be home to one of the largest concentration of maquila jobs in Mexico. Inevitably, the region has become a significant provider of manufactured components and commodities that are distributed throughout North America, and the world. What has developed there over the years is a concentration of thriving interconnected Mexico manufacturing clusters and networks that are composed of OEMs and suppliers that have created a value chain that has attracted ever increasing amounts of foreign direct investment (FDI). No economy is an island, and studying the symbiotic relationships of Mexico manufacturing clusters is advantageous in that it identifies opportunities for growth and strategic targeting as regards the supplier-manufacturer-purchaser economy. In a unique study of the El Paso/ Cd. Juárez region, the Institute for Policy and Economic Development at the University of Texas at El Paso examined customer-supplier linkages between Cd. Juárez manufacturing operations and El Paso industry. The work provides insight into areas for development among these industry clusters, with an eye towards fostering regional economic expansion, competitiveness, and industry health and stability. According to the Institute's study, the top 10 Mexico manufacturing clusters in Juárez are as follows: 1. The Automotive industry (82,000 jobs) is the largest sector, and utilizes inputs (commodities) from three significant supplier segments in Ciudad Juárez: motor vehicle parts manufacturing, iron and steel mills and ferroalloy manufacturing, and nonferrous metal foundries manufacturing. 2. Semiconductor/Electric Parts (31,000 jobs) primarily uses suppliers in semiconductor and related device manufacturing, printed circuit assembly manufacturing, and other basic inorganic chemical manufacturing. 3. Electrical Equipment (17,000 jobs) primarily uses relay and industrial control manufacturing, iron and steel mills and ferroalloy manufacturing, and printed circuit assembly manufacturing. 4. Medical Equipment (12,000 jobs) primarily uses materials from surgical and medical instrument manufacturing, surgical appliance and supplies, and advertising and related services. 5. Communications Equipment (8,000 jobs) pulls primarily from broadcast and wireless communication equipment manufacturing, semiconductor and related device manufacturing, and software publishers suppliers. 6. Printing Ink (7,000 jobs) primarily utilizes inputs from synthetic dye and pigment manufacturing, paint and coating manufacturing, and petroleum refineries manufacturing suppliers. 7. Navigational, Measuring, Electromedical, and Control Instruments (7,000 jobs) acquires most of their materials from software publishers, scientific R&D services, and printed circuit assembly manufacturing. 8. Audio and Video Equipment (7,000 jobs) relies primarily upon suppliers in electron tube manufacturing, printed circuit assembly manufacturing, and custom computer programming services. 9. Plastics Product (6,000 jobs) uses inputs from plastics material and resin manufacturing, plastics packaging materials and un-laminated film and sheet manufacturing, and other basic organic chemical manufacturing. 10. Household Appliance (5,000 jobs) utilizes plastics packaging materials and un-laminated film and sheet manufacturing, other plastics product manufacturing, and motor generator manufacturing suppliers, often from within the Juárez region.

**Semiconductors are key to US nuclear modernization**

**Chandratre et al 7**

(V.B. Chandratre et al 7, Menka Tewani, R.S. Shastrakar, V. Shedam, S. K. Kataria and P. K. Mukhopadhyay Electronics Division, Bhabha Atomic Research Centre “AN APPROACH TO MODERNIZING NUCLEAR INSTRUMENTATION: SILICON-BASED SENSORS, ASIC AND HMC” October, <http://www.barc.ernet.in/publications/nl/2007/200710-2.pdf>)

Modernization of nuclear instrumentation is pursued for realizing the goal of compact portable nuclear instruments, detector mount electronics and related instrumentation that can be designed, developed and manufactured, to mitigate contemporary instrumentation challenges. The activity aims at indigenous design and development of crucial components of nuclear instrumentation. Efforts are also undertaken to develop the critical microelectronics technologies to fulfill the gaps in nuclear instruments “ end to end”. The activity’s objective has been fulfilled by working in close collaboration with semiconductor foundries and HMC (Hybrid Micro Circuits) facilities. Various ASIC, sensors, IP cores, HMC, display devices and critical instrumentation modules developed, are discussed. The design and development of nuclear instruments require a variety of high performance components and sensors. Till recently these components were available and activity based on this approach has grown mature, with good expertise in related areas but has availability and obsolescence issues. As the technologies have moved up, various competing devices, techniques and technologies are available today. It’s important and as well prudent to catch up with these cutting edge developments, for a very strong reason that we have not been able to catch up with previous technology movements. Technology updates are difficult and have higher lead times with steeper learning curve. The Electronics Division has taken a modest initiative in fulfilling the gap in this area. Care has been taken to develop critical instrumentation by an approach of “mix and match”, integrating the newer development in the existing instrumentation on the basis of merit and requirements. Nuclear instrumentation has been a strong driver for technology developments worldwide. The low / medium energy instrumentation requirements we meet fairly with combination of NIM, CAMAC, FASTBUS and VME-based instrumentation. With use of the sensors of higher granularity, higher event rate, imaging and tracking requirements coupled with complex trigger mechanism, the approach has changed to low power detector mount electronics or monolithic sensor with electronics. Rapid developments in semiconductor technology have aided in realizing this concept.

#### That solves nuclear war

Blackwill 13 – special advisor to the Air Force’s assistant Chief of Staff for strategic deterrence and nuclear integration

(James, “Nuclear Weapons Critics Suffer Cold War Brain Freeze; Deterrence Works, Argues Top Air Force Official”, AOL Defense, 2-20-2013, Accessed 2-25-2013, http://defense.aol.com/2013/02/20/nuclear-weapons-critics-suffer-cold-war-brain-freeze-deterrence/)

There is an unsettling paradox in much of the recent debate over nuclear weapons in this country. Some pundits, fixated on purging "Cold War thinking" from those of us with real-world responsibilities for nuclear deterrence, are themselves suffering from thoughts frozen in time. In the midst of this important debate, let me offer some examples of the new strategic concepts emerging from a new generation of deterrence thinkers. The conventional wisdom is that a world with fewer nuclear weapons is inherently a better world. What we are discovering is that less is not less, less is different. US policy has led in reducing nuclear weapons. At its peak in 1967, the US stockpile stood at a staggering 31,255 warheads. Just since 1991, we have disassembled more than 13,000 weapons, and in the past decade taken our stockpile – the total number of weapons -- down from 10,526 in 2001 to 5,113 in 2010. Our nuclear weapons and delivery platforms now number an order of magnitude less than during the Cold War, and this policy continues -- creating new conditions in the global nuclear balance. In this new nuclear environment, potential adversaries are reaching conclusions we did not expect, and our allies and partners are more nervous about it than we want them to be. This new world of several contending nuclear powers behaves differently than the bi-polar world that preceded it. Deterrence is no longer (if it ever really was) a rational actor systems model; it works as a mental model. It's more like the "hot hand" rule in basketball – players do not keep mental statistics on who has the highest percentage shot for a particular game situation; instead they carry a moving mental image of who at that moment is on a streak and feed the ball to that player instinctively. The same kind of thing happens in crisis and conflict. Behavioral scientists call this "fast, frugal heuristics," and are beginning to explore the empirical dimensions of this 21st century deterrence dynamic. There are some surprising findings and insights. First, just because no one has detonated a nuclear weapon in war since 1945, does not mean they are sitting idly by, with little purpose. Nuclear weapons are in fact "used" every day -- not to win a war, but to deter any adversary from thinking they could get away with starting one. As budget pressures rise, many call for not spending more on weapons we cannot use in the kinds of conflicts most likely to occur – presumably counter-terrorism or conventional warfare. But a nuclear war is the conflict we need to make sure remains the least likely to happen. Second, there is much new research on 21st century deterrence of rogue actors and terrorists. We now know that, during the 1991 Persian Gulf War, Saddam Hussein was persuaded that if he were to order use of chemical weapons against US troops, the US would have responded with tactical nuclear weapons. Hussein had extensive discussions with his generals – lectures really – and injected that assumption into all their war planning. Such thinking likely resides within the decision-making processes of other states that face a similar calculus. There is merit in reinforcing such fears among others who would harm their neighbors. It turns out that terrorists, even suicide bombers, harbor visceral fears of nuclear weapons, fears that can be exploited to deter them from acting should they ever get one. Islamic terrorists adhere to the Koran's proscriptions against poisoning the earth with radiological effects and creating mass casualties among the innocent. Cyber and psychological campaigns can broadcast messages across terrorists' own social networks to convey this narrative challenge to terrorists' intent. Terrorist cells also fear failure, so technical sabotage, misinformation and deception can magnify doubt about the prospects for a successful detonation. Third, US nuclear weapons serve as a powerful instrument of nonproliferation. Post-Cold War experience reveals that others, from Saddam's Iraq, to North Korea, Libya, Iran and others, pursue nuclear weapons as the centerpiece of an asymmetric counter to the United States' conventional military superiority. As every other nuclear power except the U.S. modernizes their nuclear weapons, and as the number of nuclear armed states continues to grow, our allies and partners who rely on our extended deterrent are increasingly motivated to consider obtaining their own nuclear arsenal. We must actively pursue a flexible strategy that allays such concerns among allies. Some assert that a reliable nuclear deterrent does not require the ability to retaliate immediately, only the assurance that U.S. nuclear forces would survive any attack. Aside from the fact that none of America's nuclear triad is on "hair-trigger" alert, the reality of fewer nuclear weapons is that we cannot rely solely on a super-survivable second strike nuclear force that deters only by threatening retaliation. Such a posture could readily be perceived as threatening our intent to strike first. We must have a resilient nuclear arsenal that deters a nuclear strike in the first place. No president would want to ask the American people to ride out a first strike and then trust him to order a retaliatory strike on behalf of the remaining fraction of our population. What the president needs is a nuclear force that would lead no nuclear armed state, faction or terrorist to conclude that it has less to lose by striking us first, even with just one or a few nuclear weapons. We must not give anyone cause to contemplate such a move. This is a very different form of deterrence than the Cold War. No longer can we rely on the mathematics and purely rational models of nuclear exchange developed in the 20th century. We must understand human perception and decision-making. For 21st century deterrence, the value of first-strike stability is now at least equally important as maintaining an assured retaliation capability. Those of us in the new generation of strategic thinkers have liberated our minds from Cold War thinking to make sure that today, nuclear weapons are never used.

#### The semiconductor industry is low now

Nash-Hoff 11- Michele, Staff Writer for The Huffington Post (“What's Happening to U. S. Manufacturing?”, August 10, 2011 http://www.huffingtonpost.com/michele-nashhoff/us-manufacturing-crisis\_b\_922889.html\\CLans)

After dominating the globe for over 60 years as the world's largest, most productive, and technologically advanced in the world, America's manufacturing sector is in a decline in nearly all industries. America's lead in a number of industries vanished years ago, and nearly all industries are facing potentially dangerous erosion. No single indicator represents manufacturing capabilities or trends. But several key indicators, when taken together, provide strong evidence that America's manufacturing has greatly weakened in the last decade. These are: ndustrial output (as measured by share of Gross Domestic Product), industrial capacity, employment, number of manufacturers, balance of trade in goods, and import penetration rate. The trend in employment and number of manufacturers is dramatic -- 5.5 million manufacturing jobs and over 50,000 manufacturing companies gone since 2000. The balance of trade in goods has grown steadily since 1979, growing from a deficit of $25.5 billion in 1980 to $645.8 billion in 2010, which was down from a high of $835.7 billion in 2006 (Balance of Payment basis.) Manufacturing's share of the Gross Domestic Products had taken a serious downward trend -- dropping from a high of 28% in 1965 to 11% in 2010. What about capacity and important penetration? They are tied together because the capacity of American companies to manufacture products is impacted by the import penetration of the products of other countries in the U. S. market. There has been an across-the-board increase in the import penetration rate for 114 high-tech and capital-intensive manufacturing sectors -- from 21.4% of domestic consumption to 34.3 percent between 1997 and 2007. Let's take a look at a few industries. For example, if you were to go to a store to buy a set of glasses, you would have trouble finding a set made in the U. S. That's because America's oldest industry, glassware, is down to two companies that manufacture in the United States: Libbey Glass Inc. of Toledo, Ohio, and Anchor Hocking of Lancaster, Ohio. In 2009, nearly every major domestic competitor was either out of business, in Chapter 11, or up for sale. Corning Consumer Products and Oneida had already changed to outsourcing offshore instead of manufacturing their own product lines. Beginning in late 2003, Oneida closed five factories in the U. S., Mexico, Italy and China. Libbey Glass CEO John Meier blames "unfair trade" and the fact that the U.S. government is allowing foreign governments "to get away with subsidizing their producers and not enforcing their laws...." The U.S. glass industry has been swamped by imports. In 1996, imports from China and Turkey accounted for 12 percent of the U.S. market, but by 2006, imports were up to 53 percent of the U. S. market. According to the U.S. International Trade Commission (ITC), another U.S. industry has virtually disappeared -- the industry that makes travel goods out of textiles. In 2006, the total U.S. market for travel goods with an outer surface of textile materials was estimated at approximately $3 billion wholesale. The nine remaining U. S. firms identified by the ITC in this industry reported totaled revenues of $37 million in 2006. Thus, U.S. producers commanded only a one percent share of the U.S. market. This primarily reflected a decline in shipments to commercial markets. These nine companies said that at least 70 percent of their business goes to the U.S. military and government, but this market represents less than five percent of domestic production of such goods. China has become the preferred source for offshore production, since the removal of U.S. import quotas on textile travel goods in 2002, because of its low-cost labor, fabric, and accessories. In 2006, China accounted for 80 to 90 percent of imports of textile travel goods to the United States. This same International Trade Commission report stated that the United States has completely lost the capability to make high-tech warm and water-resistant clothing for the commercial market often called performance outerwear. Skiers, hikers, mountain climbers, bikers, firemen, policemen, military personnel, and those in hazardous environments use performance outerwear. The ITC identified 13 companies making high-tech jackets and pants, but six said they produce strictly for the U.S. government and military. Only two said they produce solely for the commercial market. Conflicting estimates for the U. S industry share of the commercial market range from less than five percent to 1.3 percent of the U.S. commercial market for performance outerwear. The report noted that most companies in this industry had moved production offshore primarily to Asia, namely China and Vietnam, where the technology used to produce such garments, such as seam sealing and laser cutting, is prevalent. The air conditioning industry is facing the same challenges from China that the machine tool industry is facing. The September 28, 2008 issue of Manufacturing & Technology News reported that "the last U.S. manufacturer of air-conditioning window units is moving its production to Mexico. Frederich Air Conditioning Company has announced its intention to close its San Antonio manufacturing plant and move the work to Monterrey, Mexico... The company says that low-priced air conditioners from China are forcing it to move out of the United States." This was only two months after Lennox International announced that it would shift production of Lennox air conditioners from two U.S. Plants (Marshalltown, Iowa and Grenada, Mississippi) to a new plant in Saltillo, Mexico. Lennox CEO Todd Bluedorn said, "We must produce quality products at lower costs to compete and grow our business." The trend is even more serious for the manufacturing industries that supply products, components, and technologies that the Pentagon considers import to defense. University of Texas at Austin engineering professor Michael Webber evaluated the economic health of sixteen industrial sectors within the defense industrial system. Of the sixteen industries he examined, thirteen showed significant signs of erosion, especially since 2001. The American machine tool industry is facing intense competition from foreign competitors, especially China. Machine tools are used to cut and form metal, used in nearly all manufacturing involving metals, from autos to airplanes. Foreign penetration of the U. S. market rose steadily from about 30% in 1982 to 72% in 2008. The U. S. fell from the world's third largest machine tool producer in 2000 to seventh in 2008 (behind Japan, Germany, China, Italy, Taiwan, and Korea. The U. S. loss of competitiveness in the manufacturing of five-axis machine tools exemplifies the serious erosion of this industry. Five-axis machine tools are among the most technologically advanced machine tools used in the production components in the aerospace, gas & diesel engines, automobile parts, medical, and heavy industrial equipment industries. Only six U. S. companies capable of making fix-axis machines remain, compares to at least 20 in China and 22 in Taiwan. The importance of semiconductor to today's military is well understood. Preserving a world-class domestic semiconductor industry is vital to our national security. However, the industry lost nearly 1,200 plants of all sizes between 1998 to2000, a 17% drop. The U. S. share of global semiconductor capacity fell to 17% in 2007 and down to 14% in 2009. Of the sixteen semiconductor fabs under construction around the world in 2009, only one was being built in the United States. The U. S. led the world in closure of fab plants between 2008 to 2009 - 19 out of 42. These losses have been driven by the migration of microelectronic manufacturing to low-cost foreign locations, such as Taiwan, Singapore, China, and Korea. These are just a few examples of the erosion of U. S. industries that could be included in this article. There is hardly a day that goes by without news of some company either closing a plant, having a mass layoff, or going completely out of business. General Electric chairman and CEO, Jeffrey Immelt, commented, "Over the last five years, we have really positioned ourselves as a global company . . . the world has never been more independent from the U.S. economy . . . The U.S. economy is still important, but not like it was five, 10 or 20 years ago." Immelt said that globalization is "profound. It's irrefutable and it's irreversible." He later added that the fate of the U.S. economy "is going to be decided in the next three to five years." The future looks dim for U.S. manufacturing if we continue on the same path. The trends discussed above show that we need to elevate revitalizing American manufacturing to a very high priority among policy makers. The fate of the U.S. economy will be decided in the next four to five years. The question is: Do we continue on the course to becoming a third-world country, importing finished goods and exporting raw materials, or will we rebuild our manufacturing base and once again become the premier industrial leader? If we descend into being a third-world country, then we will lose our position as the world's super power and our ability to defend our nation.

#### Cloud computing key to sustain the internet

Mark Mills, senior fellow of the Manhattan Institute, 5/31/11, Opportunity In The Internet's Voracious Energy Appetite: The Cloud Begins with Coal (and fracking), www.forbes.com/sites/markpmills/2011/05/31/opportunity-in-the-internets-voracious-energy-appetite-the-cloud-begins-with-coal-and-fracking/

High-tech products require an astounding 1,000 times more energy per kilogram to manufacture than the materials that dominated the 19th and 20th centuries. Few things are as energy-intensive to produce as the miraculous silicon graphics-processing units and memory chips which are the building blocks of the 21st century ubiquitous video paradigm. It takes a couple of kilowatt-hours to make a tiny square centimeter of silicon device that weighs about four-one-thousandth of a pound. You can make several pounds of steel with that much electricity. And we manufacture silicon devices countable in square miles each year. Overall, it takes roughly 35 times more energy just to make a pound of smart phone or notebook PC, as it does to make a pound of book. And we keep books, at least those of us that still buy books, for years, even centuries. It takes on the order of 20 times more energy to make the network video hardware (allocated pro-rata) than to manufacture a plastic DVD. Everything takes energy to build. But unlike cars and a lot of other goods which see service for a decade or more, most digital hardware has a useful life averaging three years. So when annualizing energy costs of digital device manufacturing, you amortize over a short time. And the grand total, the “net net” for the Cloud’s appetite when you count all four aspects of energy associated with digital hardware? Well, certainly much more than the oft-cited fact that ‘only’ two percent of U.S. electricity is used by data centers, since that counts, well, just data centers. Account for the other three factors around and in the Cloud and the total appetite is north of 10 percent of national electricity use. So the U.S. digital economy uses roughly as much electricity the entire country of England, likely more. For some, this may seem like an environmental problem. For many, it is more of an operational challenge in achieving yet more growth with minimal fiscal, not just environmental, energy-related costs. In a now ten-year-old pioneering study, The Internet Begins With Coal, and a related co-authored Forbes article (Dig More Coal: The PCs Are Coming) I set off a firestorm of environmental protest (and frankly, some puerile commentary). The main problem with past and many current protestations about estimating the digital economy’s energy appetite lies in a myopic focus on data centers, and failure to consider all aspects of the digital infrastructure. As for the future, doubtless we’ll continue to hear what we’ve heard for years. Technology will make digital stuff more efficient so the energy ‘problem’ will be ameliorated if not conquered. We’ve seen this play before. Radical efficiency gains have occurred; but these efficiency gains are precisely what created, and creates more overall demand. And more efficiency gains are coming. Intel [NASDAQ: INTC] has announced it will cut energy appetite of microprocessors almost three-fold. Data storage is practically free and getting cheaper in both energy and dollar terms per byte – consider what it costs for a 10 GB memory stick today compared to a few years ago, or terabytes of back-up at Carbonite. Overall data center efficiency has also soared in recent years as “virtualization” algorithms have radically improved the utilization of the thousands of servers under roof. The technical literature is filled with ideas, designs and materials in power electronics and software with potential to increase energy efficiency in cell towers, data centers and handhelds, some by as much as 30 to 50 percent. A similar trend characterized the emergence of the auto age. Car engine energy efficiency improved 500 percent pound-for-pound from early years to the late 20th century. Greater efficiency made it possible to make better, more featured, safer, usually heavier and more affordable cars. So rising ownership and utilization lead to 400 percent growth in transportation fuel use since WWII. The flattening of automotive energy growth in the West is a recent phenomenon as we finally see near saturation levels in road-trips per year and cars-per-household. We are a long way from saturation on video ‘trips’ on the information highways. Efficiency gains are precisely what creates and increases overall traffic and energy demand; more so for data than other service or products. From 1950 to 2010, the energy efficiency of information processing improved ten trillion-fold in terms of computations per kWh. So a whole lot more data-like machines got built and used — consequently the total amount of electricity consumed to perform computations increased over 100-fold since the 1950s – if you count just data centers. Count everything we’re talking about here and the energy growth is beyond 300-fold. Fundamentally, if it were not for more energy-efficient logic processing, storage and transport, there would be no Google or iPhone. At the efficiency of early computing, just one Google data center would consume more electricity than Manhattan. Efficiency was the driving force behind the growth of Internet 1.0 as it will be for the wireless video-centric Internet 2.0. In energy terms, video traffic is the equivalent of migrating all car drivers from Civics to Tahoes. So power use and hardware to produce and manage it will get dragged along for the ride. Who is playing in these energy fields? Not surprisingly, all the data guys themselves, from Google, as noted, to Microsoft [NASDAQ: MSFT], HP [NYSE: HPQ], Cisco [NASDAQ: CSCO], IBM [NYSE: IBM], Juniper [NYSE: JNPR], Intel – all of them. Running below the typical excitement radar is a constellation of traditional old-world electric-equipment companies, both large and small, who make all the power electronics components, devices and services that are now the ascendant and often primary costs across the data domain, especially in data centers, commercial enterprises, and manufacturing plants. Familiar names like GE [NYSE: GE], Eaton [NYSE:ETN], Emerson [NYSE: EMR], Siemens [NYSE: SI], ABB [NYSE: ABB], Honeywell [NYSE: HON], Johnson Controls [NYSE: JCI], and Schneider [FR: SU-FR]. Check any of their web sites and you’ll see lots of chest-thumping about powering the digital economy. There is a grand convergence going on between the old economy’s electrical infrastructure, and the new economy’s digital infrastructure. There is, as well, a symmetrical convergence taking place over in the utility sector’s smart grid – a story for another episode. Drill down a layer deeper in the ecosystem of engineering players and you find less well-known and often smaller players – in America still, sometimes today’s small is tomorrow’s giant — and a vast landscape of public and private companies, to name a very few to illustrate the diversity; Celestica [NYSE: CLS], , Quest, Intergy and Raritan. Add to the list of emerging players many start-ups and small companies like Power Analytics which (where, full disclosure, I am a board member and we are investors) has pioneered enterprise-level software to visualize and predict the complexities of data center power to marry the oppositional forces of reliability and efficiency. Drill down further into the basic component layer and we find lots of device and component companies. Of particular interest are those developing next-generation power semiconductors – notably those using silicon carbide, and gallium nitride rather than silicon – which will enable smart power networks the way microprocessors enabled smart communications networks. Our old friends at Cree [NASDAQ: CREE], better known for making LEDs, are one of the power-semi leaders with recent silicon-carbide device releases. Another bubble brewing on the energy-tech front? You bet. But anchored in the reality of the physics of information, not perceptions of consumer proclivities. Certainly the growth of Facebook, Twitter, LinkedIn, Netlix, and Vevo, and many similar emerging is the face of growth and even froth. You may have trouble knowing where to place bets on the downstream domain, but **the winners upstream are easier to bet on because all Internet companies require underlying infrastructure**. No surprise then that the pace of data center construction is picking up, from Microsoft’s new 10-football-field-sized Quincy, Washington data center, to Equinix’s recent announcement to build its eighth data center in New York. One recent survey found up to one-half of data centers need to expand over the next two years, with over two-thirds of data centers expecting to run out of power before the end of next year. The same survey found virtualization has pretty much wrung-out the maximum from installed hardware. Virtualization has been the biggest single energy relief valve, and it’s largely over. Another survey found that 95 percent of data centers experienced at least one unplanned outage over the past couple of years – power was the central issue two-thirds of the time– with an average cost of over $0.5 million per outage. The energy issue has moved to front-and-center. Hans Thirring in his 1958 book, Energy For Man, was probably the first person to consider and calculate the total energy cost of information and communications. (A citation to his work appears probably for the first time in nearly 50 years in the book I co-authored, The Bottomless Well.) Thirring was prescient. Only now is the technical community starting to give this issue its just due. Maybe the investment community will follow. Meanwhile, the coming wireless broadband explosion promises to create a vortex of electricity demand. Lots of companies will prosper bringing new technologies and innovations to the digital energy ecosystem. Some see the energy appetite of the Cloud as a problem. Others amongst us see it as evidence of a new global tech boom that echoes the arrival of the automotive age. We’re back to the future, where the microprocessor today as an engine of growth may not be new, anymore than the internal combustion engine was new in 1958. It’s just that, once more, all the components, features and forces are aligned for enormous growth. With that growth we will find at the bottom of this particular digital well, the need to dig more coal, frack more shale….

#### Extinction

Eagleman 10

[David Eagleman is a neuroscientist at Baylor College of Medicine, where he directs the Laboratory for Perception and Action and the Initiative on Neuroscience and Law and author of Sum (Canongate). Nov. 9, 2010, “ Six ways the internet will save civilization,”
http://www.wired.co.uk/magazine/archive/2010/12/start/apocalypse-no]

Many great civilisations have fallen, leaving nothing but cracked ruins and scattered genetics. Usually this results from: natural disasters, resource depletion, economic meltdown, disease, poor information flow and corruption. But we’re luckier than our predecessors because we command a technology that no one else possessed: a rapid communication network that finds its highest expression in the internet. I propose that there are six ways in which the net has vastly reduced the threat of societal collapse. Epidemics can be deflected by telepresence One of our more dire prospects for collapse is an infectious-disease epidemic. Viral and bacterial epidemics precipitated the fall of the Golden Age of Athens, the Roman Empire and most of the empires of the Native Americans. The internet can be our key to survival because the ability to work telepresently can inhibit microbial transmission by reducing human-to-human contact. In the face of an otherwise devastating epidemic, businesses can keep supply chains running with the maximum number of employees working from home. This can reduce host density below the tipping point required for an epidemic. If we are well prepared when an epidemic arrives, we can fluidly shift into a self-quarantined society in which microbes fail due to host scarcity. Whatever the social ills of isolation, they are worse for the microbes than for us. The internet will predict natural disastersWe are witnessing the downfall of slow central control in the media: news stories are increasingly becoming user-generated nets of up-to-the-minute information. During the recent California wildfires, locals went to the TV stations to learn whether their neighbourhoods were in danger. But the news stations appeared most concerned with the fate of celebrity mansions, so Californians changed their tack: they uploaded geotagged mobile-phone pictures, updated Facebook statuses and tweeted. The balance tipped: the internet carried news about the fire more quickly and accurately than any news station could. In this grass-roots, decentralised scheme, there were embedded reporters on every block, and the news shockwave kept ahead of the fire. This head start could provide the extra hours that save us. If the Pompeiians had had the internet in 79AD, they could have easily marched 10km to safety, well ahead of the pyroclastic flow from Mount Vesuvius. If the Indian Ocean had the Pacific’s networked tsunami-warning system, South-East Asia would look quite different today. Discoveries are retained and shared Historically, critical information has required constant rediscovery. Collections of learning -- from the library at Alexandria to the entire Minoan civilisation -- have fallen to the bonfires of invaders or the wrecking ball of natural disaster. Knowledge is hard won but easily lost. And information that survives often does not spread. Consider smallpox inoculation: this was under way in India, China and Africa centuries before it made its way to Europe. By the time the idea reached North America, native civilisations who needed it had already collapsed. The net solved the problem. New discoveries catch on immediately; information spreads widely. In this way, societies can optimally ratchet up, using the latest bricks of knowledge in their fortification against risk. Tyranny is mitigatedCensorship of ideas was a familiar spectre in the last century, with state-approved news outlets ruling the press, airwaves and copying machines in the USSR, Romania, Cuba, China, Iraq and elsewhere. In many cases, such as Lysenko’s agricultural despotism in the USSR, it directly contributed to the collapse of the nation. Historically, a more successful strategy has been to confront free speech with free speech -- and the internet allows this in a natural way. It democratises the flow of information by offering access to the newspapers of the world, the photographers of every nation, the bloggers of every political stripe. Some posts are full of doctoring and dishonesty whereas others strive for independence and impartiality -- but all are available to us to sift through. Given the attempts by some governments to build firewalls, it’s clear that this benefit of the net requires constant vigilance. Human capital is vastly increasedCrowdsourcing brings people together to solve problems. Yet far fewer than one per cent of the world’s population is involved. We need expand human capital. Most of the world not have access to the education afforded a small minority. For every Albert Einstein, Yo-Yo Ma or Barack Obama who has educational opportunities, uncountable others do not. This squandering of talent translates into reduced economic output and a smaller pool of problem solvers. The net opens the gates education to anyone with a computer. A motivated teen anywhere on the planet can walk through the world’s knowledge -- from the webs of Wikipedia to the curriculum of MIT’s OpenCourseWare. The new human capital will serve us well when we confront existential threats we’ve never imagined before. Energy expenditure is reduced Societal collapse can often be understood in terms of an energy budget: when energy spend outweighs energy return, collapse ensues. This has taken the form of deforestation or soil erosion; currently, the worry involves fossil-fuel depletion. The internet addresses the energy problem with a natural ease. Consider the massive energy savings inherent in the shift from paper to electrons -- as seen in the transition from the post to email. Ecommerce reduces the need to drive long distances to purchase products. Delivery trucks are more eco-friendly than individuals driving around, not least because of tight packaging and optimisation algorithms for driving routes. Of course, there are energy costs to the banks of computers that underpin the internet -- but these costs are less than the wood, coal and oil that would be expended for the same quantity of information flow. The tangle of events that triggers societal collapse can be complex, and there are several threats the net does not address. But vast, networked communication can be an antidote to several of the most deadly diseases threatening civilisation. The next time your coworker laments internet addiction, the banality of tweeting or the decline of face-to-face conversation, you may want to suggest that the net may just be the technology that saves us.