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The 5 Most Dangerous Trends in Manufacturing

Today, manufacturing is in danger of extinction in the United States. This is due to the quest for short-term corporate profits, and government policy that is hollowing out America's industrial base.

Probably the most impact comes from a business practice known as "asset light". This is an accounting driven policy based on the belief that a company does not have to own actual assets; it just buys or rents them as required. While there is some validity to this process, applied in an uncontrolled fashion it can lead to the demise of a company. We will look at 5 trends that are the most dangerous in manufacturing today and their implications to manufacturing firms.

The 5 Most Dangerous Trends in Manufacturing:

- Contracting Core Expertise
- Buying Technology instead of having internal R&D and Innovation
- Government Support of Outsourcing
- Loss of American Industrial Competence
- Hidden Dangers in Outsourcing

These five trends describe conditions that if not addressed, may lead to industrial decline and the permanent inability of the United States to compete with the world. On a smaller scale it means that local companies will not be able to compete in the United States, and will either have to move offshore themselves or disappear into history. This paper will explore the dangers of outsourcing globally and how understanding the process can allow companies to compete on a world stage.

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Dangerous Trend #1 Contracting /Outsourcing Core Expertise

Many companies, looking to control (read reduce) costs will outsource manufacturing and engineering activities. CEO's or board members driving finance do not always seem to consider long-term effects of their actions are most often driving the outsourcing core expertise. HR experts or consultants who simply look at the overall cost of operations often assist them in the loss of expertise. In this scenario, long time employee is looked upon as an expense and let go in the name of efficiency without consideration for the undocumented expertise they have. The company convinces itself they can buy what they need. But the short-term increase in bottom line often spells the virtual end of the road for the company.

Schwinn Bicycle Company was started in 1895 in Chicago. Through a series of evolutions, the company grew to be the leading producer of bicycles. By 1950, the name Schwinn became synonymous with bicycles. One aspect of the Schwinn bicycle was that the name Schwinn was everything. If there was a component sourced to Schwinn, it was labeled "Schwinn approved". Raleigh bicycles of England, which was the English 'Schwinn" was not so protective and marketed components as value added. One such example was that Raleigh bicycles came with a Sturmey Archer three or five speed gear system. Schwinn remained solidly Schwinn, jealously guarding the name. The sole exception was Italian made Capagnolo components on Schwinn flagship Paramount model, which cost over $1000 in 1975. Schwinn remained the king of bicycles in the USA.

By the mid 1960's, the company began to become saddled with labor expenses common to older companies with legacy costs. Labor issues were handled badly, causing the workers to organize under the UAW. To counter this, Schwinn began to outsource, first with components, later with entire operations. In the end, Schwinn contracted manufacturing to Panasonic bicycle of Japan and later Giant bicycles of China.

As this evolved, Schwinn began to lose itself. For the first time, component names began to appear on Schwinn bicycles; Shimano, KKT, Diacompe, and Sunshine to name a few. But the change was more than a name. Engineering was done in Japan and China, and these companies began to make changes to the styles of components to suit their taste. Gradually Schwinn became less Schwinn, and Giant and other Asian bicycle companies played off the component recognition provided by Schwinn to gain a foothold in Schwinn's home market. Schwinn could not fight back, since by now they lacked the in house ingenuity to compete with the Asian component makers. As market share dropped, Schwinn ended up in a series of reorganizations and buyouts, culminating in the bankruptcy sale of the company's assets in 2001.

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While this is the short version of the story, the scenario remains valid. If a company gives up control of its core expertise as Schwinn did with bicycles and bicycle components, they ultimately risk their long term viability and dominance. No matter what critics may say, Technology belongs to those who touch it at its core.

In the end, Giant has gone on to become the worlds' largest bicycle company, and Schwinn, is a contract built nameplate. What remains of the Schwinn bicycle stores is quickly being eaten up as Schwinn badge bicycles are sold in Wal-Mart and Costco.
Other companies may be headed down the same path. Motorola, adopting the asset light strategy (code words for outsource) is becoming an also ran in the handset market, a market that it created. Once a leader of the pack, it follows the trend of other brands, with manufacturing technology moving to its subcontractors.

In the Aerospace domain, Boeing is outsourcing more than 70% of the airframe and components on the new 787 Dream Liner. Signs of the future could already be there for Boeing. The 787 has been beset by delays to an extent never seen before in the launch of a Boeing plane. And core technologies are solidly in the hands of their contractors.

Could the Schwinn bicycle Scenario play out for Motorola and Boeing? We could start from what they have in common. Boeing is number one in aircraft, Motorola was number one in wireless handsets and Schwinn was number one in bicycles.

On the other hand, The Lego Building Block Company was founded in 1959. Lego is a relatively low-tech product consisting mainly of a series of interlocking building blocks. While the product is simple, the toy market is incredibility competitive. Lego however has steadfastly protected its brand and maintained in house product development. Low cost imitators have barely made a dent in the market as Lego thrives with ever evolving products. There is even a Lego land amusement park run by the company. Moving to the 21st century, Lego has added 32 bit controllers and automation devices. This venture has been so successful that there is now an international Lego League. This league hosts an annual international Lego Robotics championship. This competition features Thousands of competitors from around the globe. Lego stores are booming and yet the product can be found in big box stores, like Wal-Mart, Target and Costco. Holding your corporate strategy tight and controlling the development and manufacturing is a better strategy than wholesale stripping assets and blindly outsourcing.

When I was 6 years old, my mother bought me my first Lego set. They were becoming popular because it was said that you could learn from them. Maybe we still can.

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Dangerous Trend #2: Buying Technology Instead of Having Internal R&D and Innovation.

A hallmark of virtually every successful company in the early to mid 20th century was having a substantial research and innovation development arm. Not to be mistaken for product development, this was basic science level discovery and improvement. Companies like Western Electric (later AT&T) studied basic materials related to their products. Materials from conductors to insulators, to plastics and ceramics, basic product knowledge kept products in a class by themselves. Certain material discoveries would then spawn a market of their own. The downside, not to be overlooked by the financial world, was that some discoveries just went nowhere.

Some companies made research and innovation a part of their paradigm. Most famous is the 3M corporations. Famous for everything from scotch tape to pot scrubbers and post it notes. A look at 3M's history shows how new products developed from internal research and innovation development.

When they were first developing sandpaper products in 1910, the company invested $500 in a small research laboratory to solve problems. The company soon came out with Three-M-ite, an abrasive cloth product superior to anything on the market. The company grew. Ten years later, 3M-combined knowledge of adhesives and paper to develop masking tape, a product still produced and copied today. In the 1930's when cellophane was developed, 3M researchers soon came out with a similar product, cellophane tape-known today as Scotch Tape.
Realizing the roots of their own success, 3M established a Central laboratory in 1937 with the purpose to explore ideas with potential long-term benefits. Again and again 3M followed this pattern of research, innovation and expansion until it became the 15 billion dollar global giant it is today.

This was a pattern similar to all the giants of industry, AT&T, Motorola, Kodak and others. But outsourcing R&D and innovation has slowed this growth. Why, because the thinking is different. It revolves around a product and support for that product.

Motorola grew from mobile radios in the 1920's to two way radios in the 1930's to field radios in the 1940's. In the 1950's this grew to walkie-talkies. In the 1960's communications became personal with the mobile car phone and later with palm sized pagers, and finally the cell phone. All of this was made possible with R&D and innovation. In the late 1990's and into early 2000's, Motorola began to shed technical workers and scientists. This was seen on Wall Street as cost cutting and the more that was cut the more the stock performed, feeding the beast.

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In the early 1990's the stock was in the $4-$6 /share range. By the mid 2000's it was in the high teens at $14-18/share. The long-term results of this strategy have become most apparent at late. The stock has fallen to the $4-$8 / share range. The products made by Motorola are generally still high quality products, however a closer look will reveal what the loss of scientific and engineering resources has cost in the long run.

A Birdseye view of technology makes it appear that Motorola has lost its edge. Nokia and others were able to launch a camera phone before Motorola. Motorola enjoyed Success with the Razer, but missed the follow up 3G wave. The phonemically successful I-phone had several competitors launch before Motorola. The product-to-product connection has gone, and caused the global leader to miss market advancements. The connections are needed if Motorola is to ever have surge in price back to historical levels.

Could Motorola still be on top with traditional R&D and innovation? Consider this; Motorola was formerly partnered with Apple Computer in both hardware and software development. Following a traditional R&D and innovation model, Motorola and Apple may have come out with the I-phone together.

This does not say all outsourcing is bad or a poor way of doing business. Motorola has always outsourced some work, just as Apple computer was outsourcing processors and chipsets to Motorola. Most of the industrial communities in the country generally centered on support for key industries and in fact, no large company ever was 100% self-sufficient. But sourcing your technology leaves you at the mercy of the vendors who themselves see future connections, but may only share them if it is in their best interest.
Not having R&D and innovation to take the next step could let a competitor or current vendor beat you to the punch…and patent it, locking you out for the next 15-20 years.

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Dangerous Trend #3 Government Support of Global Outsourcing

Government Support of Global Outsourcing is difficult to control because it is the product of special interest groups. These Special interest groups are very heavily funded, and control or have special access to elected officials. Unlike decisions on outsourcing at a company level, this is impossible to fight without the benefit of a trade group.

The dangers of government support of Global outsourcing are twofold. First there is the support of large corporations who no longer view themselves as American companies, rather as world companies. These companies have no compunction using cheaper labor in another country to do a task. They are often blind to the risks posed such as theft of intellectual property or poor quality control. They are just as likely to take aid packages from foreign governments to set up shop, as they are to take the same jobs packages from local governments.

They are often very powerful as well. James McNerney was elected chairmen of the board of Boeing in 2005. Mr. McNerney has been heavily involved in technology companies throughout his career and is a powerful voice in the aerospace industry. Mr. McNerney is also the former chair of the US China business council and is considered a globalist.

Groups collectively known as globalists, have worked their way into Washington circles including congressional defense committees are actively promoting global sourcing of defense systems. This is very dangerous because if a country cannot control the very weapons used to defend itself it stands little chance of survival. During the 1991 gulf war, Switzerland temporarily blocked the sale of bomb components used in laser-guided munitions. While the block was short lived it underscored the point that other systems may be prone to stoppage, or even sabotage and adulteration.

Another issue is that trade industry lobby groups, which had long held power in Washington are running into Globalists lobby group that are pushing members of Congress to relax trade restrictions.

Loosening these trade restrictions often pits American companies against countries with unfair labor practices. The Globalists call it free trade; the industry groups call it dumping. Many of these same countries also have unfair government support in the way of their own tariffs and taxes.

An even bigger issue began with President Richard Nixon and has continued gradually ever since; Lifting Technology Export Restrictions.

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In 1972, Richard Nixon opened trade to China. A famous part of this was the sale of 6 Boeing 707 jets to China. Prior to this most Aerospace technology was banned from export. After this initial icebreaker every President has lessened trade restrictions on military or "dual use" (military or civilian use).

McDonnell Douglass-Now Boeing eventually opened a MD-80/82 assembly plant to manufacture small airliners.

In 1996, President Clinton personally approved the sale of nuclear hardened microchips to China. These are semi conductors designed to work under intense induced radiation found under nuclear battlefield conditions, and in outer space. This was approved auspiciously for use in Chinese meteorological satellites, however this is technology with direct military use, and the technology was undoubtedly copied.

With the technology taboo essentially broken, companies and their trade groups continue to push to use artificially low labor at the expense of local subcontractors.

As of 2008, Boeing was considering future contracting of P&A (Power and Airframe) inspections to China. This could be a critical decision for the US Aerospace industry. First, it would contract high paying technical jobs out of the country, causing unemployment in the skilled Aerospace worker trade. Second, just as has happened in the electronics industry, it would involve growing the Chinese aerospace industry and essentially inviting a competitor into the business. The short term, would probably work out with little issue. The long term threat is Boeing having insufficient engineering and technical resources for the next generation of airplanes…Schwinn Bicycles all over again.

The key is Government support of industries. This is a tricky concept.
If you are talking support of industries as in support of Boeing, Support of Motorola, you are talking about Government helping a specific, this is a bad case, because it really does not look at what is good overall.

However, if by industry, you mean identifying core competencies, and inducing companies to stay in the United States, you are talking inclusive policy.
For Example in the Chicago Area, Siemens Energy recently opened a windmill factory in Elgin Illinois. This facility has the capacity to employ more than 250 people. Not far from Elgin in Aurora Illinois, a UK subsidiary of Dish Network is tooling up to build TV satellite dishes and related equipment. Both of these companies got at least local government assistance to locate in these somewhat depressed areas. Both are also taking advantage of the depressed dollar, making US labor cheaper. This is good for companies, good for business and good for labor.
Using the recession and a weak dollar to their advantage American contractors and subcontractors can fight government supported globalism and become global exporters.

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Dangerous Trend #4 Loss of Labor Market Competence

The current trends in manufacturing are especially troubling because of the long-term impact on manufacturing and on society in general. The greatest threat is to the labor force, specifically the manufacturing labor force. Loss of skilled trades' people will only exacerbate the problems of keeping a manufacturing base.

To many it is a chicken and egg question. Is America's economy changing to service industries because of the loss of manufacturing jobs, or has moving manufacturing simple left no choice. Many today see a polarized economy, which is being called an hourglass economy for growth at the top and bottom and shrinking in the middle.

Labor economist Harry Holzer (Urban Institute and Georgetown University) cautioned that metaphors of an "hourglass economy" might be overstated. He noted that many mid-level jobs shouldn't be disappearing including jobs in technical support, and crafts or trades and these job categories should generate large numbers of new openings as the current jobholders retire. Holzer expressed concern that the polarization metaphor is leading to a polarized education policy, focusing on college for all and standardized testing.

Those businesses that have committed themselves to staying in manufacturing are finding this concern of Holzer's true and are having an ever more-difficult time staffing. While there is no shortage of low-end machine operator type labor, there is a distinct vacuum in the semiskilled to skilled labor pool.

Examining this further, the statistics from the Bureau of Labor Statistics (BLS) shows that while there is a 10% -20% drop in jobs for traditional skilled trades (toolmakers, die setters, journeyman machinists) the number of these individuals reaching retirement age is increasing even faster. This should lead to job opportunity; however this is where Holzer's concerns are evident.

Secondary schools education programs have indeed been changing with a reduction in industrial arts and related vocational training. In some cases it has been replaced with computer education, a fair deal since many modern factories depend on computer literacy from everyday work, to programming CNC machines, and other factory automation.

Larger urban areas have especially felt the pressure to have "fair" education interpreted as "everyone goes to college". This is happening at the expense of both the students and employers. While some vocations show lower earnings than professions, many with vocational careers actually had the potential to be high earners. During the 1970's through the 1990's a tool and die maker with his own shop and some business savvy could become a millionaire.

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The truth is American education and stereotypes in society are causing the conditions of a poor labor market and eroding the manufacturing labor base.
Unless more is done to ensure that American Manufacturing has a solid labor base, American production will struggle and that in itself will be reason for a company to outsource globally.
Like politics, these battles are best fought by Industry Trade Groups such as TMA and PMA and others. Owners of Job Shops and Contract Houses should be active in and push their respective trade groups to make sure that legislation is not passed to limit resources, or that legislation limiting resources is removed.

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5 Hidden Dangers of Outsourcing Globally

Finally, there needs to be a discussion about outsourcing globally. It is common knowledge that the larger the system, the more difficult it is to navigate. Add to that crossing boarders and crossing cultures and Global Sourcing is more that it seems on the surface.

Transportation is a big issue with global sourcing. Unless the product is small and extremely light, transport by air is out of the question. Even if it is air transportable, the cost is significant, and careful financial analysis needs to be done to review the price plus transportation.
With countries oceans apart, roads and long haul trucks are similarly out of the question. This leaves only transport by sea for bulk cargo.

In days gone by, a shipper would contract with a shipping company. They would go to a sea cargo company, and the material would be scheduled on the next available ocean liner.
Things have changed in the modern world of shipping by sea. To maximize cargo space, most modern ships use standardized shipping containers. These containers are known as intermodal, because they can be lifted off trucks and trains and are carefully stacked onto the ships.
Similarly the container can go from the truck to the train and vice versa for the land based shipping portion of the trip. This eliminates the need to repack cargo at the port.
While this system does contain efficiencies, larger companies' best exploit these efficiencies. This is because the company facility will pack the containers right outside (and sometimes inside) their firms; ship directly to port and from port, to their respective locations.
Many times however, companies that are outsourcing don't have or even need full containers. Companies that are outsourcing smaller quantities of wheels, components, connectors and the like need to build in an extra step compared to the big companies.

Companies known, as freight forwarders will collect shipments from a company and other companies, then arrange to ship complete containers. To ship a partial container for a single customer would be cost prohibitive.

Likewise when the container arrives, the forwarder needs to unpack and distribute the freight. This can add a week or more on either end. In today, just in time environment, timing can kill a job.

On the shipping end itself, a modern cargo ship can cross the pacific from Hong Kong to LA in 10-14 days. The cargo can take from 1 to 2 weeks to clear customs.

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Doing the math, a business looking to outsource a small part from China can expect to do the following;

Pack and Delay at freight forwarder	3	to	10	days
Queue and Loading at the Port	2	to	5	days
Ocean transit	10	to	14	days
Clear Customs	5	to	14	days
US freight Forwarder	3	to	5	days
Total	23	to	47	days

In short, the transportation time once an order is actually produced, is 3 to 7 weeks and on top of this needs to be added the actual production scheduling. If tooling is required, a company could be looking at 3-4 months from CAD drawing to parts.

After a long delay, the company who outsourced to Asia hopes that the parts arriving are good. Quality itself has several aspects when dealing with global sourcing.

The first aspect is quality pertaining to the customer requirements. Does the part match the print? Is the material correct? Is the process in control? By being in control, it means that the part can be made within established limits. All of the parts must fall within the limits, even if some parts are above nominal and some are below nominal dimension. In most cases when outsourcing in the US, the shop can provide statistical data and will often have an onsite review. Some companies outsourcing to Asia may decide to have an onsite review. This is a drain on a company as there is a full day of travel each way to and from Asia. Airline tickets, hotels and travel all add up, but don't actually get applied to the cost of a product. Once you arrive in Asia, and you visit the site, you run into the language barrier. Savvy businessmen will employ translators to ensure proper translation and prevent information from being hidden.

Then there is quality of materials. The United States, Europe and Japan have all developed extensive materials standards. These are in the form of ISO, ASTM, ASI, JIS and EN standards. By having these standards, it can be assured those metals and plastics or other, materials will have correct and predictable properties.

Many Asian countries including China and India have are just developing standards. Companies manufacturing in these locations usually would pick and choose if and what standards to use and many still do. Again this is an unstated risk.

There is also considerable safety risk. The United States, Europe and Japan all have developed safety standards for all materials to reduce or eliminate exposure to lead, cadmium, asbestos and other dangerous chemicals. One such Standard, begun in Europe is known as RoHS. This standard is becoming more accepted in the US among manufacturers who also ship goods

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overseas, especially Europe. It specifies and bans certain known toxic materials and manufactures need to make their goods and being in compliance with RoHS. Very troubling is that some of the RoHS banned substances have even shown up in toys made in Asia. There are

houses, built in the US with Asian wallboard, emitting chemicals that are actually causing pipes to corrode and leak. Pallets have not been treated to prevent pests and According to the Sierra club, millions of acres of trees are dying from beetle infestation.

With long distances, costs and poor government support legal recourse and compensation has been nearly non-existent.

Finally, along the lines of legal recourse; outsourcing globally carries the risk of unspoken alliances and poor legal recourse. A Chicago base stamping and tooling house, Buhrke, built an entire press line for a canning company in South Korea. This included tools, dies and transfer presses and equipment in the millions of dollars. Once installed, the company declared bankruptcy.

The Chicago based company could find no legal recourse and itself was forced into bankruptcy. Going back to Government support of global outsourcing, the company found little help in the US government.

Outsourcing in and of itself is not a bad course of action. The Ford Motor Company has outsourced parts of their cars since they were introduced in 1908. Virtually no major manufacturer in any industry, no matter how vertically integrated, has ever made 100% of a product internally. The American auto industry, Electronics industry and Aerospace industries have all had a family of subcontractors partners with whom they have strategically outsourced work.

Based on the five most dangerous trends in manufacturing, outsourcing blindly in order to save costs may actually hurt a business in the long run. Businesses should look at these factors when choosing to outsource, and look closely:

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