Taking Back Manufacturing to Canada with *Disruptive technologies*!

How Canada’s economy with currently an ailing resource sector with a diminished manufacturing base will stack up in this future of more nationalistic and shorter but hopefully more sustainable supply chains will depend on political will to drive a directive to “make much more of what we consume”.

We will have to embrace effective industrial policies, new and yet to be defined trade agreements, maintain a stable currency, reduce legislative and regulatory overhead, re-develop a social focus on manufacturing artisanship and industrial learning systems, and drastically improve many other national competitive factors to Take Back Manufacturing.

*Continuous Improvement mindset needed*....

Our Industry leaders need to ensure their management teams are ready for action to improve our local plants with a reinstalled mindset for Continuous improvement and LEAN thinking, which many experts agree has been dissipated due to the many years of the distractions of an offshoring focus on cheap labor and long supply chains.

*Disruptive technologies .... The new imperative*....

An important and emerging competitive factor will be the incorporation of so called Disruptive technologies and cyber physical automation solutions into our future factories.

Future products that could return for local manufacturing will not be the products that were off-shored, they will have new technology in both the products and the manufacturing process, and will demand new facilities, capital, knowledge, skills and getting on board what is now deemed INDUSTRY 4.0 ...the next industrial revolution!

Many new industrial technology development organizations are emerging in Canada to provide such solutions which with early adoption may provide an opportunity to change our competitive game and level the global playing field. But, much more needs to be done to support the development of these technologies and educate the industries on how they may be applied.

Here are some of these disruptive technologies and how they will impact the future....

*Additive Technology needs more emphasis*....

Much has been said about 3D printing/Additive technology, and the industrial applications are profound in terms of how they can change products and business process. We now have this technology available in both a wide range of plastics and metals but we need a stronger emphasis on designing products for this technology to enable access to the advantages. This must include integrating new design thinking across the whole product life cycle to undertake new and improved 3D Printed Rapid prototyping and early production and adopting 3D printed hi performance production tooling strategies to re-life
traditional industries and breed new industries. Many of us now visualize a strategy to operate a 3D print electronic warehouse so we can build 3D printed parts on demand in small quantities at both product early life and end of life and eliminate inventory burden and improve flexibility to customers.

**Cyber-physical systems will lead the 4th Revolution...**

In the last, the 3rd industrial revolution (from 1970 until now) we have added significant computerization to our manufacturing and business processes. But we still have many environments in industry where we as humans are trapped in the process working for the computer, not computers working for the process and benefiting us. An example is how Enterprise Resource Planning systems still struggle via multiple transactions (some of them semi manual or manual) to keep a firm real time grip on a dynamic manufacturing process.

Cyber-physical systems using “SMART” Sensor Technology, IIOT networks, and advanced wireless position and transaction system technology will enable not only the advancement of Robotics” and autonomous guided vehicles, but allow us to place computers much more seamlessly into our processes so we can eliminate transactional waste and solve some of the major interface issues between computers and process management. This will also allow us to redeploy human skills much more toward improving our processes and even further evolve how we do business.

Following these dreams of autonomously self-guiding vehicles and processes that use sensors and wireless positioning systems to eliminate transactions will allow factory designers to take the whole business process to the next level...

**Artificial intelligence and Big Data....**

Computer technology in the last few years has taken a huge leap forward in terms of computing power measured in operations per second and has now the capability to generate enough information density and complex algorithms to become a form of artificial intelligence.

This will enable them to handle what some are calling “Big Data” such that everything we want to know about a subject or event can be stored as a real time complete body of knowledge and used at will.

The AI systems can then operate upon massive multiple algorithms and data much faster than human thought, with almost the same level of complex logic and decision capability.

**The Industrial Internet of Things.**

Although the technical term is “connectivity” the public is embracing the Internet of Things and its industrial version the Industrial Internet of Things (IIoT) This is suggesting that more devices and subsystems will be “connected” than ever before...
Move ideas not materials....

The other disruptor is the “globalization of Ideas” via collaborative and connected platforms that allow remote interaction and is breeding a cloud based mentality and hopefully constructive crowd sharing of resources/skills/knowledge and funds in a very interactive manner. The control of IP will be an issue, but in principal the globalization of moving ideas around is far more sustainable than the globalization of moving products and materials around the globe.

The next industrial revolution is on the way...

These technological disruptors have now come together to form the next industrial revolution 4.0

This allows the “smart factory” concept to be conceived and start us on a journey toward a new factory of the future using these Disruptive technologies that will be a combination of these technologies.

These technological disruptors are now leveling the manufacturing playing field between so called low cost labor countries and mature or developed countries as technology has taken up the labor cost differentiation. The future differentiator and most important value proposition is serving the demand of the local customer in the most sustainable LEAN and GREEN manner with short supply chains.

This provides a window of opportunity to take back the future for our manufacturing sectors and our economy..... but it’s a case of start disrupting.... or be disrupted!

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