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**“Realizing Inclusion & Industry 4.0”
Manufacturing, Education, and Community**

Framing the Conference

1. Opening Comments:
 - A. Inclusion and Industry 4.0 is a complex issue and we are just at the beginning of the discussion.
 - B. In my comments, I'll introduce provide a framework for today's gathering posing some of the basic questions and providing some definitions.
 - C. My comments will focus on:
 - 1) Why manufacturing matters;
 - 2) How manufacturing is changing—Industry 4.0 is here—what is it?
 - 3) What is industrial policy and why does it matter.
 - 4) And what do we mean by “inclusion” in “Inclusion & Industry 4.0,” and
 - 5) Our next steps.
2. First—Why Manufacturing Matters? We can't re-state this enough.
 - A. It is the only sector that can build a broad-based middle class;
 - 1) The average annual wages in manufacturing are \$75,000 when you include benefits.
 - 2) It's the multiplier. Each job in manufacturing generates at least 5 other jobs including those in other sectors. Each job in the service sector generates 1 job, and each job the retail sector generates ¼ of a job.
 - 3) It has to be the foundation of economic policy and community development in this city.
 - 4) It is a key sector in addressing the environmental crisis—Climate change won't be solved just by lawyers suing companies. It will be solved in part by the invention and use of new processes and products needed to restore our environment.

- B. It creates social capital. Manufacturing requires creative, critical thinking and teamwork. Employees in manufacturing become better family members, better citizens, and better leaders.
 - C. Manufacturing is the essential foundation for a modern society—we can't afford its decline.
3. Manufacturing is changing—Industry 4.0 is here.
- A. Low skilled work has largely been shipped off-shore;
 - B. Our companies have shifted to advanced manufacturing to remain competitive in the global economy making more complex products with complex processes.
 - C. In doing so, they are embracing new technologies including robotics, artificial intelligence, digitalization, 3-D technology, laser and nano technology. These are technologies that do amazing things in the creation of new products and services that were unimaginable a few years back.
 - D. Using these new technologies can increase the number of employed by expanding market share.
 - E. These new technologies can increase the quality of work in manufacturing—shifting repetitive and menial work to robots while training workers to make, install, repair, and guide the use of robots—work requiring skills, critical thinking, and team work.
4. There is a potential dark side. These are also technologies that can replace workers and decrease the number of people needed to produce a product. Should we be worried about this? Yes!
- A. World Economic Forum founder, Klaus Schwab, commented on the potential for advanced manufacturing and technologies to widen the gap between rich and poor. He said, "...my biggest concern (is that) the fourth industrial revolution will...increase the inequality which we have."¹
5. That's why we need an industrial policy that explicitly recognizes "inclusion" as a goal equal to that of technological innovation in manufacturing.
- A. What is **industrial policy**? It is the official policy of the government to encourage the development and growth of the manufacturing sector at a city, a state, and national level. It's a policy that needs to be shared and supported by the major sectors of our society including the business community, labor, and civil society. It is focused on improving the competitiveness and capabilities of companies. It defines key programs as well as sets specific goals and objectives.

¹ *Chicago Tribune*, "Davos elite urged to pay heed to global inequality" by Pan Pilas, January 19, 2015, Section 2 page

B. Every advanced country including our competitors has a formal industrial policy.²

- 1) In China, 29% of GDP is generated by manufacturing.
- 2) In Germany, 22% of GDP is generated by manufacturing. Germany is a world leader in utilizing robotics in production yet their unemployment rate is of the lowest in Europe.
- 3) In the Basque Country, 25% of GDP is generated by manufacturing. As we will hear, they have embraced these new technologies and increased their market share in the global economy leading to increased employment and tax revenues in their society that support world class education and health systems.
- 4) In Afghanistan, 11% of GDP is generated by manufacturing.
- 5) In the US? 12%--one percentage point ahead of Afghanistan and down from 25% in the 1960s. We should be alarmed. We need an ambitious industrial policy.

6. **What is Industry 4.0?** It was first advanced by Germany and placed today's new technologies in an historical context. It has become accepted as an international standard. It speaks to the evolution of revolutionary changes in manufacturing technology.

- 1) First Industrial Revolution in the 1800s included mechanization, water power, and steam power;
- 2) The Second Industrial Revolution refers to the advances made in the 1900s including mass production, assembly lines, and electricity;
- 3) The Third Industrial Revolution refers to the huge technological advances in the mid-20th Century with the emergence of computers and automation; and
- 4) The Fourth Industrial Revolution—or Industry 4.0—embraces connecting automation to computers and building machines that can think. It includes the emergence of robots, artificial intelligence, nano-technology, 3 D printing, and other technologies that are transforming the manufacturing sector.

7. We need to fully embrace Industry 4.0. We need to support and encourage it's adoption by our manufacturing sector, but...

A. We must ensure that manufacturing will be developed in a way that serves all communities, that it is a "tide that lifts all boats." We need to be explicit in affirming the social as well as economic objectives in the embrace of these new technologies.

This is an issue of social justice.

² <https://www.indexmundi.com/facts/indicators/NV.IND.MANF.ZS/rankings>

This is all about tapping into all of the talent that could be available to our manufacturing sector.

It is about building public support for the American manufacturing sector.

Inclusion will be our competitive advantage in the global economy.

8. Who needs to be included when we talk about “inclusion.”

A. **Certainly including Black and Latino communities.** Historically, the African American and Latino community served as the backbone for the growth of our manufacturing sector, yet typically ended up in the lowest paying, dirtiest, and most dangerous jobs. They were the last hired and the first fired. Senior positions in production, management, and ownership are reserved for whites. 99% of Illinois manufacturing companies are owned by whites. This is a legacy that needs to be candidly and boldly acknowledged and reversed.

We must ensure that inner city communities in particular are provided with the educational infrastructure to fully participate in advanced manufacturing. The failure to build an appropriate educational infrastructure in the inner city linked to 21st Century manufacturing reflects policies of 21st century segregation. And segregation is alive and well in Chicago and urban centers around the country.

B. **Certainly including Women.** While there are some notable exceptions nationally and locally, manufacturing has been led by males at all levels of the firm and in the sector.

C. **Certainly including Workers.** Context is critical in the application of new technologies. Workers at all levels of the firm are a critical source of new ideas, of obstacles, and of innovative solutions. We need to promote highly participatory approaches to management that tap into the knowledge of those who execute the production plan as well as welcome employee ownership.

D. **Certainly including Low income communities in general:** We don’t have to go any farther than Chicago’s West and South sides as well as the Southland to see the great disparities in how funds are allocated for the building of infrastructure, the transfer of technologies, the access to services, and the investment in education. The cost is not only to residents but to the companies that have stayed in these communities despite the challenges—companies like Freedman Seating and Laystrom Manufacturing.

9. Who benefits from “Inclusion & Industry 4.0?”

A. **Manufacturers** who support and champion inclusion can gain full public support for policies that benefit the manufacturing sector

1) Companies get the talent they need. We can end the skills gap;

- 2) Companies get successors who can buy the business so the founders get the true value of a life's work rather than liquidation value. We can end the succession gap.
- 3) Companies can get the business climate they need to compete—tax, regulatory policy, city assistance, support for research and development, and access to capital when they are broadly recognized as central to the interests of the whole society—not just a special interest group.
- 4) We can secure the political support needed to pass legislation that is essential for the future of manufacturing.
 - a) With the hard work of the Chicagoland Manufacturing Renaissance Council Legislative Committee and Ministers for Manufacturing, Rep. Mary Flowers—a leading Black legislator--introduced HB 0052 that calls for \$36 million in funding for 12 high school programs linked to manufacturing throughout the state. It was passed with bi-partisan support with vote of 79 to 31 in the House and it's on its way to the Senate in this coming session.

B. **Our workers and employees benefit from “Inclusion & Industry 4.0** knowing that they don't need to fear, oppose, or resist the adoption of new technologies as they become a major part of job security.

C. **Our communities**, particularly in the inner city, can welcome the re-growth of the manufacturing sector. Family-supporting and interesting careers will be available including those in production, product development, engineering, management, and ownership.

- 1) The Safer Foundation--leading organization in the region that serves people with convictions—has placed over 200 men and women in the manufacturing positions and who have an unheard of recidivism rate of 11%.

D. **Our local, state, and federal government benefits from “Inclusion & Industry 4.0:** Again, the average wage in manufacturing is \$75,000 when you included benefits. This converts into a tax base that can support social programs and lower our budget deficits. It converts into lowering the demand on public services like the use of the emergency room for non-life threatening medical issues since manufacturing jobs typically provide health benefits.

And, critically important is the fact that increased development in our communities will result in the reduction of violence. The best way to stop a bullet is a good job.

10. **What are the next steps in Realizing Inclusion & Industry 4.0.**

- A. Expand the Chicagoland Manufacturing Renaissance Council as a champion for I&I 4.0

- 1) Next meeting: June 19 from 3 to 5 at Daley College. Join if you haven't.
 - 2) Our next forum will focus on worker ownership and participatory management as key components of Inclusion and Industry 4.0.
- B. Support and expand the existing programs on inclusion in education and training.
- 1) Manufacturing Connect
 - 2) Southland Robotics
 - 3) The Jane Addams Resource Corporation
 - 4) The Safer Foundation
 - 5) Bethel New Life and
 - 6) Daley College
 - 7) But recognize that these programs are serving hundreds when the manufacturing sector needs thousands—we need to take these programs to scale!
- C. **We need to support and expand the Ownership Conversion Project.** Ownership succession is an existential threat for the manufacturing sector. Small companies are at risk because of the demographic reality that old white men who own the companies are retiring, and often don't have a capable successor within the family to take over and sustain the company. The Ownership Conversion Project addresses this issue by identifying these companies, assessing their value, identifying entrepreneurs including employees as well as Black and Latino men and women and assisting them in the purchase. Everyone wins.
- D. Finally, we must have accountability. We need to convene a **Taskforce on Inclusion & Industry 4.0** that can define and propose the next steps in measuring the performance of our education as well as our research and development infrastructure in achieving full inclusion.
- 1) For example, hundreds of millions of public funding have been raised for research and innovation institutes. What percentage of those funds should be allocated to benefit both communities as well as smaller companies that are in the inner city as well as benefiting the majors like John Deere, Caterpillar, GE, Boeing and others.
 - 2) What portion of our state education budget should be allocated to manufacturing programs in low-income communities?
 - 3) What percentage of our city infrastructure budget should explicitly target the manufacturing sector on the West and South sides and the Southland?
11. **We need to build our partnerships with US organizations like The Century Foundation and the Urban Manufacturing Alliance** in shaping a national agenda around I&I. We need to take the next steps in building our partnership with the Basque Country and others in the international community committed to as the basis for mutual learning, partnerships, and exchanges.

12. **And we need to make sure that Chicago is the national leader in showing the power and promise of Inclusion & Industry 4.0.**
13. Finally, let me introduce my friend and colleague, Mr. Jorge Arevalo, the Deputy Minister for Vocational Training of the Basque government and the Representative of the Basque Government in the Basque Council for Social Inclusion.
 - A. My contact with the Basque Country over the years has profoundly shaped my career. I was introduced to the Basque Country through the BBC Documentary on Mondragon in 1980. Anyone who saw that film can relate to the movie—*Close Encounters of a Third Kind*. The Mondragon story profoundly challenged my perceptions on how manufacturing could be managed; carrying over into my vision when I started MR in 1982.
 - B. Inspired by what I saw, I created my first industrial cooperative in 1989 at Bankers Print in Chicago.
 - C. I visited Mondragon and the Basque Country in 2003 that further deepened my understanding of what was possible in building a manufacturing sector anchored in inclusion.
 - D. In 2005, we created Austin Polytech Academy on Chicago's West inspired by Mondragon. Our vision is that young people will learn the technical skills required in manufacturing and the values that tie these skills to building community.
 - E. **This is truly a country that punches above it's weight.** It is influencing our world on how we can develop as truly sustainable societies through the power of manufacturing profoundly tied to social inclusion.
 - F. Mr. Arevalo.....