

Disrupter Series: The Internet of Things, Manufacturing and Innovation

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Good morning to the members of the Committee and to my colleagues who have come to Washington to discuss the importance of the Internet of Things (IOT). Before I begin, I would like to thank Congressman Latta for his continued leadership and engagement on this issue. I also want to thank the committee for the opportunity to discuss why IOT is important to US manufacturing companies and my company, Owens-Illinois.

Owens-Illinois, headquartered in Perrysburg, Ohio, is the world's largest manufacturer of glass containers serving globally recognized brands. Our company operates 79 manufacturing plants throughout the world, 17 of which are located in the United States.

Glassmaking has historically been a trade where master craft-persons and apprentices would develop expertise on the art of glassmaking. At the turn

of the century, Michael Owens invented automated glass manufacturing which was a huge step change in productivity and worker safety. While the glassmaking process is highly automated, the industry is poised for the next step change, which will come from the factory becoming increasingly connected with IOT technologies throughout the end-to-end processes.

The information collected through IOT technology will be used to transform the “craft” of glass making to that of a data driven science, which will enhance the competitive position of glass in the global packaging industry.

Glass containers are the most sustainable option in the competitive packaging landscape with a lifecycle that goes from “cradle to cradle.” Reusable in many markets and infinitely recyclable into new glass containers or other products, glass is the true sustainable packaging option.

Owens-Illinois is on an IOT journey, which will transform our manufacturing process and add value to the products and services that we sell our customers.

There are several IOT areas of focus for O-I:

1. Improved manufacturing performance through higher yields, increased quality, and reduced costs.
 - a. IOT will deliver deeper insights into our end-to-end manufacturing process. The data generated from sensors in the plants will provide insights into environmental conditions, process settings, and control variances enhancing our ability to increase first-time yields and improve quality. This work will require skilled engineers, information technology professionals and data scientists.
 - b. The data acquired through IOT will be used to reduce reaction time in the plants and allow us to adjust the process if the controls are slipping out of tolerance. Addressing the variations in the manufacturing process will be realized in a more proactive manner.
 - c. The IOT platform will transform the glass manufacturing process from one of reactivity to one that that is proactive and highly automated. The information generated by new sensor technology, data science, and manufacturing automation will increase yields, and improve quality while achieving reduced

costs and enhancing O-I's ability to compete in the US and global markets.

2. Energy management and predictive maintenance are the second area of IOT development O-I is pursuing.
 - a. It takes a great deal of energy to melt and form glass and to operate a glass container manufacturing facility. Developing sensor technology can help glass containers maintain the status of the most sustainable packaging solution and reduce energy used to operate a furnace.
 - b. Advanced sensor technologies can also be used to collect information while monitoring equipment throughout the manufacturing facility and could be critical to seeking new ways to maintain equipment.
3. IOT technologies and technological adjacencies is enabling O-I to develop new and differentiated products and services for our customers with the goal to ensure the integrity, safety and authenticity of the contents.

I would like to highlight several concerns regarding the successful deployment, and sustainability, of IOT.

1. The cost to achieve a full deployment of IOT throughout an enterprise can be quite daunting. A successful deployment of IOT requires sensors, PLC's, IT systems, networking, massive amounts of storage, and software to achieve the desired business outcomes. Seeking ways to make these investments more affordable can be a way to help US manufacturing accelerate its investment in IOT technologies.
2. Protecting against cybersecurity risks will become more critical while manufacturers deploy IOT in facilities. Manufacturing equipment, devices, sensors and control systems that previously may have been standalone may be exposed not just within a plant location but also potentially throughout an enterprise. Cybersecurity related disruptions could cause unplanned downtime or impair productivity.

Cybersecurity attacks could also put the health and safety of people at risk.
3. Data scientists are in short supply and high demand and transformation of the work force becomes more critical. Tomorrow's manufacturing workforce must be increasingly knowledgeable about the use of information technology. Engineering disciplines and information technology skills will be needed to deliver and sustain

these solutions. The use of business intelligence, analytics and the role of the data scientist will be critical to the success of IOT.

In conclusion, as manufacturers continue on the IOT journey, Congress may want to look into the following areas to help foster the growth of IOT technology and use in the years ahead:

1. Assist manufacturers in making IOT technologies more affordable by encouraging research and investment in these capabilities or in programs which encourage manufacturing companies to deploy IOT solutions.
2. Support programs or resources that address cybersecurity in US businesses.
3. Encourage more research in the IOT data science discipline and seek ways to encourage a supporting pipeline of skilled workers through universities and manufacturing related technical schools.

Thank for your time and attention.