Cognishen Focus

Disruption & Adoption of Industry 4.0

Volume 2 Issue 7, July 2023

In the previous newsletters, we saw that Industry 4.0 will enable your business to be highly flexible and resource efficient. We discussed a maturity model for Industry 4.0 in the last newsletter. We saw that Industry 4.0 has the potential to disrupt your business if you do not adopt its principles. This disruption of technologies is of great importance to many businesses. We will discuss the potential disruption due to Industry 4.0 and its impact on your business.

Disruption

Disruption, as opposed to sustainability of technology changes, was coined by Christenson1 in the late 1990s. Technological changes often happen much faster than people and organizations can adapt as shown in Figure 12. Disruptive innovations cause a significant change and abruptly interrupt the operations of a company. It is widely acknowledged that there is a period of adoption. We see that in the digitalization and emerging technological advances that constitute Industry 4.0. This gestation period can become a "make or break" for many companies. Most businesses face risks when they implement innovative ideas because the disruptive innovation might prove to be a failure in the dynamic market. Netflix, as an example, was fully aware of the risks during its disruptive entry into the digitized movie and TV shows market. Companies must be aware of the potential losses and remain positive in embracing disruptive technologies.

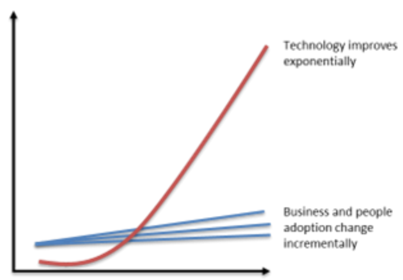

Figure 1 Technology Disruption
Source: Downes, L. & Mui, C., (1998)[2]

Adoption of Industry 4.0

Companies should be looking into how they can improve their products and related services to get ahead of competition. Global competition makes firms continuously improve their products to result in reduced product life cycle. Furthermore, newer technologies force firms to upgrade their manufacturing processes for better business performance. Such technological disruptions are becoming more frequent than ever before, and Industry 4.0 is no exception.

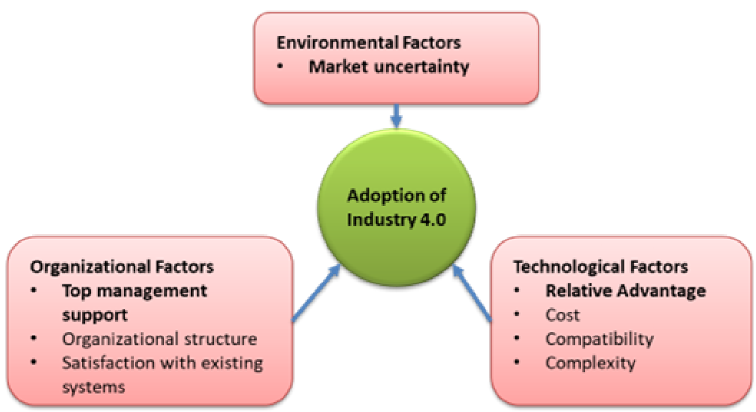

Figure 2 Adoption Factors of Industry 4.0
Source: Prause, M. (2019)[3]

Practical Insight

How to integrate technology into day-to-day operations?

"First, digital strategy should not be separate from operational strategy in a firm. The manufacturing floor workers must buy into the digital solutions. This can be achieved by discussing with them how such technologies can help them in their day-to-day work.

Second, enabling access to data from various operations of a firm is crucial as it provides the needed visibility to the people who need it.

Third, insights and analytics from that data should be enabled to be viewed by users as it can throw light on current status, bottleneck problems, and their underlying causes.

Fourth, now that you have the basics in place, you can start integrating solutions into production facilities and throughout the operations to benefit better decision making.

Fifth, even though there are a vast number of tools available for Industry 4.0, firms must make sure to obtain the right ones for the right operations and for the right users. Keeping in mind that technologies will continue to evolve and better solutions will be available in the near future is an important aspect of the selection of components and tools for Industry 4.0.

For example, Hitachi Vantara's Lumada Manufacturing Insights is a suite of IoT applications that help enterprises reduce unplanned downtime, predict asset failures, and manage asset performance, as they accelerate on their digitalization journey. It magnifies a manufacturer's knowledge by extracting data from industrial equipment and support systems to guide data-driven decision-making."

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The adoption of Industry 4.0 depends upon many factors for SMEs. As seen in Figure 2, technology, organization, and environment play important roles towards adoption of Industry 4.0.

Market uncertainty, the environmental factor, plays an important role in the adoption of Industry 4.0. Market uncertainty stems from technological disruptions, degree of competition, volatility in demand, uncertain supply, and political pressures. Smart factories can mitigate the risks of market uncertainty by supporting mass customization using intelligent information from reliable data. Implementing the digital transformation components of Industry 4.02 balances the market advantage to organizations and provides stability in demand management, sales, and competitive advantage.

Technological factors such as costs, complexity, and compatibility may seem to be the factors for adoption intuitively. However, **relative advantage**, the degree of benefits for an organization in addition to its existing factors of benefits1, is an important factor for adoption of Industry 4.0 by SMEs. Relative advantage in an Industry 4.0 world can be obtained by accelerating the adoption of forefront technologies. Please see our previous newsletters2 for an introduction to Industry 4.0 components. Using the forefront technologies provides an infrastructure of self-adaptive technologies and digitalized processes, which will allow organizations to better respond to customer needs, cut operational costs, and provide information to make wise decisions.

Top management championship is an important factor to institute organizational norms and values and how the company perceives innovation. If the top management believes in innovation, they can shape the company's strategy to adopt the digitization processes.

Industry 4.0 disruption in SMEs

The disruptive technologies of Industry 4.0 involve massive effects on existing industrial structures to allow gains in operations and quick decision-making. Such innovative technologies will help companies build a more flexible structure thereby dynamically changing their operational lines to produce quality and cost-effective products. SMEs have to be innovative and invest more in technologies in order to succeed amidst the increasingly challenging times.

Innovation is a major factor to defend disruption. In managing disruptions, SME management should be aware of such disruptions and know how to manage such disruptions. The problem is the managers are busy with their daily routines and tend to focus on daily operational chores. Moreover, SMEs face another big problem. The disruptive technologies of Industry 4.0 is not yet over. We will see more and more newer technologies in the near future and SMEs have to prepare for them as they adopt Industry 4.0. As newer technologies arrive on the scene, adopted technologies become obsolete and newer skills are required. The depletion of competence is serious, and the one way is to embrace reliable technology consultants who have knowledge of newer technologies and how to adopt them quickly in the operations.

Reference:

[1] Christensen, C. M. (1998). *The innovators dilemma: when new technologies cause great firms to fail.* Harvard Business School Press: Boston, MA.
[2] Downes, L. & Mui, C., (1998). *Unleash the Killer App – digital strategies for market dominance.* Harvard Business School Press: Boston, MA.
[3] Prause, M. (2019). Challenges of Industry 4.0 Technology Adoption for SMEs: The Case of Japan. *Sustainability 2019,* 11, 5807.
[4] Rogers, E. (1995). *Diffusion of Innovations.* Free Press: New York, NY.
[5] Cognishen, Inc. *January to April 2023 Newsletters*

Practical Insight

Industry 4.0 and embracing disruption

"Over the past 10 years, 70% of companies on the Fortune 1000 list have vanished. One country that has taken a proactive approach to this is Germany, with the founding of Industry 4.0, its vision for the future of manufacturing.

The failure to react to new technologies, in this case Industry 4.0, could well be catastrophic for some manufacturing firms. The fourth industrial revolution, driven by digitization should be a business priority. You should take stock of what technologies you are currently deploying and what you could still do. Moreover, do not overlook the skills associated with it – both in the current and future workforce. "

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