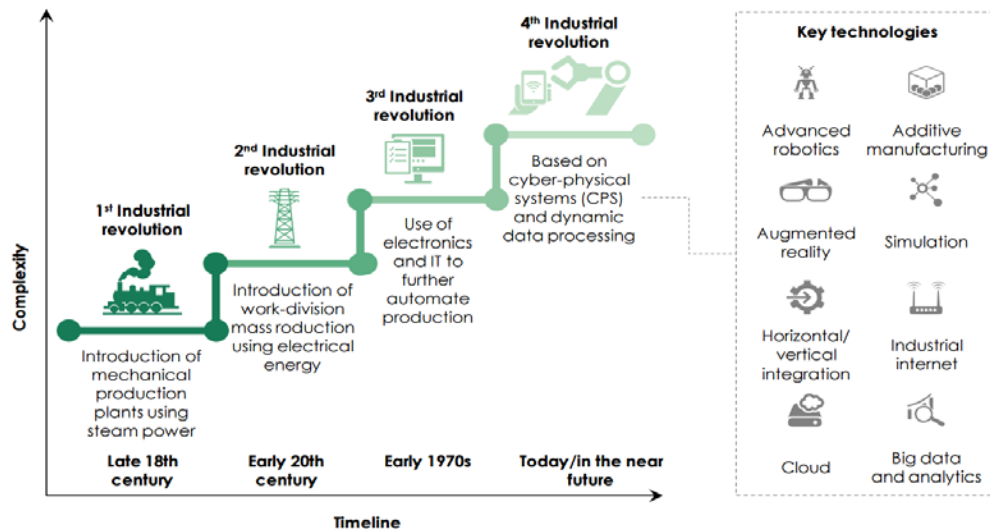


Embracing Industry 4.0 (July 2017)



Source: Boston Consulting Group

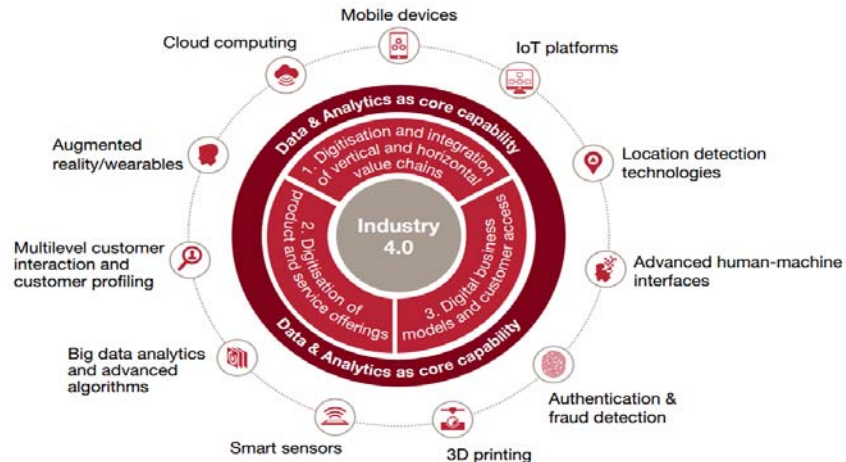
History and development of Industry 4.0

The first Industrial Revolution, beginning in Great Britain at the tail end of the 18th century and ending in the mid-19th century, represented a radical shift away from agriculture-based economy to the introduction of mechanical production methods through the use of steam and first machines. The second industry was focusing on the use of electricity, the important use of effective assembly line and the birth of mass production. The third era of industry is the beginning era of automation, when robots and machines began to replace human workers on those assembly lines.

The latest development in technology brings along computers and automation working together in an entirely new way and the term Industry 4.0 came out. The term Industry 4.0 refers to the combination of several major innovations in digital technology, all coming to maturity right now, all poised to transform the energy and manufacturing sectors. These technologies include advanced robotics and artificial intelligence; sophisticated sensors; cloud computing; the Internet of Things; data capture and analytics; digital fabrication (including 3D printing); software-as-a-service and other new marketing models; smartphones and other mobile devices; platforms that use algorithms to direct motor vehicles; and the embedding of all these elements in an interoperable global value chain, shared by many companies from many countries.

A German government memo released way back in 2013 was one of the first times that 'Industrie 4.0' was mentioned. The high-tech strategy document outlined a plan to almost fully computerize the manufacturing industry without the need for human involvement.

Angela Merkel, German chancellor, spoke glowingly of the concept as recently as January 2015 at the World Economic Forum in Davos, and called 'Industrie 4.0' the way that we "deal quickly with the fusion of the online world and the world of industrial production."



Source: PWC, 2016 Global Industry 4.0 Survey

In Malaysia, the Ministry of International Trade and Industry (MITI) taking the lead by conducting study, having talks with the relevant agencies, conducting seminar with the industry players and government officials and the ministry expected to formulate the National Industry 4.0 Blueprint by the end of the year.

Benefits of Industry 4.0:

Additional revenue from:	Lower cost and greater efficiency from:
Digitising products and services within the existing portfolio	Real-time inline quality control based on Big Data Analytics
New digital products, services and solutions	Modular, flexible and customer-tailored production concepts
Offering big data and analytics as a service.	Real-time visibility into process and product variance, augmented reality and optimisation by data analytics
Personalised products and mass customisation.	Predictive maintenance on key assets using predictive algorithms to optimise repair and maintenance schedules and improve asset uptime
Capturing high-margin business through improved customer insight from data analytics	Vertical integration from sensors through MES to real-time production planning for better machine utilisation and faster throughput times
Increasing market share of core products	Horizontal integration, as well as track-and-trace of products for better inventory performance and reduced logistics
	Digitisation and automation of processes for a smarter use of human resources and higher operations speed
	System based, real-time end-to-end planning and horizontal collaboration using cloud based planning platforms for execution optimisation
	Increased scale from increased market share of core products

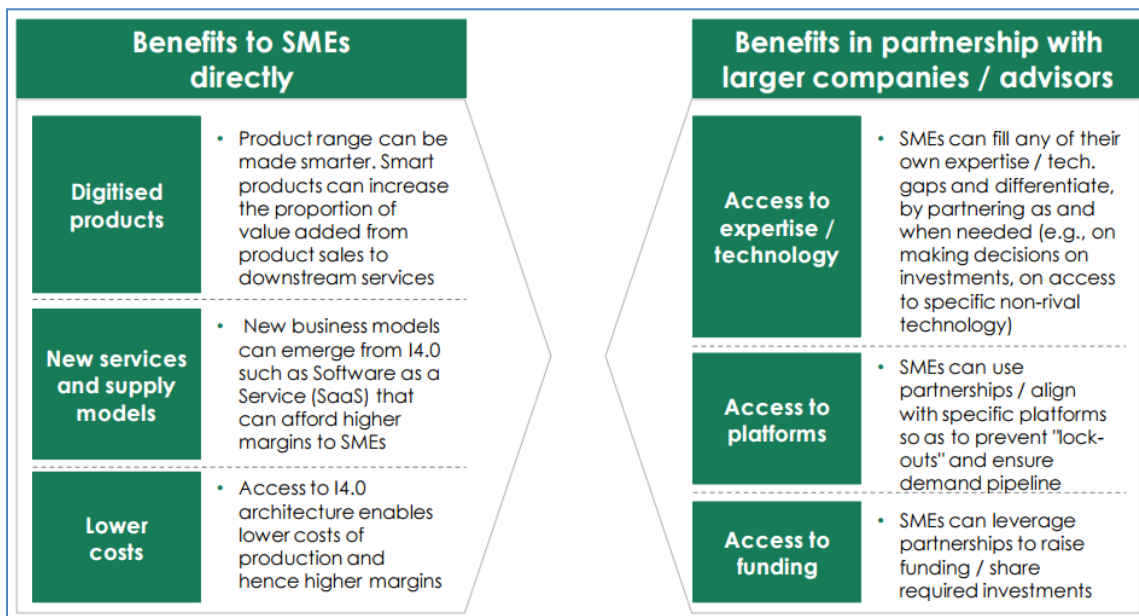
Bernard Marr, What Everyone Must Know about Industry 4.0: Challenges of adopting Industry 4.0

- Data security issues are greatly increased by integrating new systems and more access to those systems. Additionally, proprietary production knowledge becomes an IT security problem as well.
- A high degree of reliability and stability are needed for successful cyber-physical communication that can be difficult to achieve and maintain.
- Maintaining the integrity of the production process with less human oversight could become a barrier.
- Loss of high-paying human jobs is always a concern when new automations are introduced.

- And avoiding technical problems that could cause expensive production outages is always a concern.

Additionally, there is a systemic lack of experience and manpower to create and implement these systems plus a general reluctance from stakeholders and investors to invest heavily in new technologies.

But the benefits of an Industry 4.0 model could outweigh the concerns for many production facilities. In very dangerous working environments, the health and safety of human workers could be improved dramatically. Supply chains could be more readily controlled when there is data at every level of the manufacturing and delivery process. Computer control could produce much more reliable and consistent productivity and output. And the results for many businesses could be increased revenues, market share, and profits.



Source: Boston Consulting Group: MITI Workshop on Industry 4.0