

MSc Industry 4.0 Advanced Manufacturing

Advanced Industry 4.0 Report



How Digital Data interacts with business
models under industry 4.0

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Introduction

As aerospace awakens from the protracted pandemic winter, Safran Seats GB is currently re-emerging in the market. Due to the global pandemic and order slump, Safran Seats GB has become a leaner and more adaptable company. To establish itself as the global leader in custom aircraft seating solutions and guarantee a better and healthier return for its shareholders, it is still seeking out additional organisational performance profits, a decrease in material cost, and to guarantee that the results gains must not drive behaviour and attitude away from the necessary regulations and legislation. This research examines elements of digitised data to align businesses with Industry 4.0 principles, hypothesising that the higher volume of data and the simplified format for getting the data will reveal not only input efficiencies but also output efficiencies.

In order to align organisations with Industry 4.0 concepts, this report explores many aspects of digitised data. It makes the assumption that the increased data volume and the easier format for obtaining the data will expose both input and output efficiency.

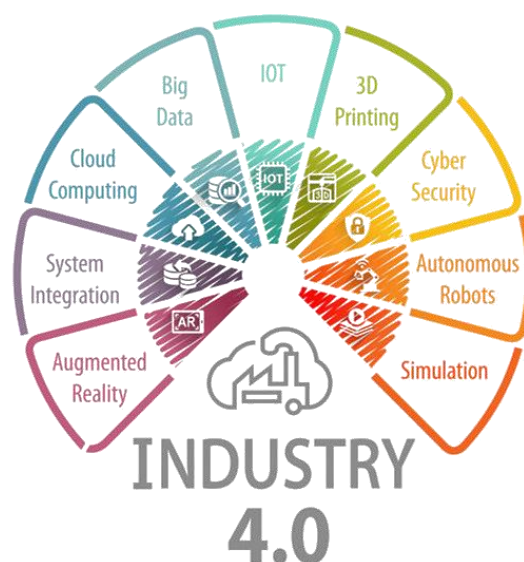
What is industry 4.0

The nine pillars of Industry 4.0 can be used in different combinations to improve or rewrite a company's present business strategy or operational model, even though they are not all equally applicable. It is the responsibility of the organisation to comprehend and assess the benefits and possible risks of adopting or modifying a business model. Unfortunately, no manuals have been published to direct or advise an organisation in what will be best for them. However, there are numerous case studies that may be reviewed to allay some worries when considering this sort of activity.

The nine pillars are broken down as:

- Augmented Reality – AR
- System Integration
- Cloud Computing
- Big Data
- Internet of things – IOT
- 3D Printing
- Cyber Security
- Autonomous Robots
- Simulation or Digital Twin

(Roche, 2019)



Current Data system at Safran Seats GB

Currently, the data system in SGB for want of a better word is ad hoc. All relevant data is stored but stored and retrievable in many formats and different lead times. The current formats are as follows

- Onsite digital data – local server
- Onsite paper records
- Offsite digital data – Parent company server
- Offsite digital data – 3rd party retainer
- Offsite paper records – 3rd party retainer

What you can surmise from this are a number of assumptions

- The time to locate the data – required to know what format and where
- What are we actually storing – how much noise is in the system from the hoarder syndrome

Retention of data in the case that it may be needed at some point is the same as a conventional hoarding whereby the retention of items under the premise that they may be needed someday (American Psychiatric Association, 2022)

It is important to keep in mind that most of the existing paper and digital data is just handwritten information that has been converted to digital form. When retrieval is necessary, both of these types of data preservation present a basic problem. This problem concerns the calibre of the written text, which includes the letters' formation as well as the grammar and spelling. Other factors to think about include the capability of real-time data mining or lack thereof since this fundamental incapacity to process data has a significant impact on consumer satisfaction.

Elements of Industry 4.0 for effective data management

Big data and analytics

The complexity and connectivity of modern industries are expanding, posing new problems that big data may solve. Modern computer systems' massive data output has allowed intelligent factories to significantly raise their efficiency and achieve notable benefits in terms of uptime, production speed, and error reduction. The utilisation of the interconnectivity is allowing for the data to be ready at the point of use requirement. What is key from this standpoint is that the information is in a uniform format (computer generated). (Immerman, 2021)

In order to find patterns in the data, correlations, and other insights, big data analytics explores vast volumes of data. With today's technology, you may evaluate your data and practically instantaneously obtain answers from it. (SAS, 2022)

Bernard Marr (2015) "The real value is not in the large volumes of data but what we can now do with it".

System Integration

System integration is offering more consolidated, structured data for easier, more efficient decision-making, this can be massively advantageous to any organisation.

Data collection and analysis are now more straightforward than ever. System integration enables manufacturers to gather, store, organise, and comprehend data from a range of sources using business management tools including Enterprise Resource Planning (ERP) systems. This effectively creates a single, consolidated home for all data collected across the enterprise, resulting in easier, more effective data administration as well as more insight into overall business operations. Information is provided via system integration to people who require it at the appropriate time and location.

One single place is provided for data collection by a system integration system. Many companies either don't gather any data at all or do collect data but don't know what to do with it, making the data worthless. By giving the organisation access to a single source of data, System Integration seeks to address this problem by allowing the organisation to view all acquired data in one location. Data may thus be more easily compared and evaluated to support future strategic decision-making.

by enhancing the company's planning, scheduling, and performance visibility. To maintain a healthy balance between day-to-day management and advancing growth in the form, the organisation may swiftly access data from all levels of company operations through system integration. The organisation

is better equipped to identify areas that need development and can establish realistic performance objectives for the future thanks to the collection and presentation of data from throughout the whole organisation. This “Whole” organisation may also include interconnected sister companies where the intercompany activity takes place. (Essin, et al., 2020) (SL Controls , n.d.) (Cognizant, 2022)

Cloud Computing

Using remote server facilities is known as cloud computing. A user or business can rent a piece of the available space in order to launch their programmes or apps. Infrastructure as a Service is the most prevalent type of computing service for larger organisations. This way of working provides organisations with a cheaper alternative rather than onsite servers.

Businesses have a range of cloud options to choose from, all with various levels of security. As organisations may be easily hacked and the theft of important data could become public if the incorrect cloud type is chosen, the firm or person needs must be conscious of the security level. Private clouds can be hosted by businesses, but owing to security precautions, only individuals with the right permissions can access them. This solution is costly and needs in-house IT management and maintenance. There is a disadvantage to the possibility of remote accessibility. Businesses may benefit from the best of both worlds in terms of hosting their data thanks to the hybrid cloud model solution. A public network can host general programmes whereas a private network may be used to store sensitive data. But care must be taken to provide a stable and conflict-free network connection. (Google, 2022) (Oracle, 2022)

Conclusions

In conclusion, a company that ignores the generation and preservation of data in a digital environment faces the danger of continually being behind. Poor customer satisfaction, inefficient production, large levels of inventory owing to subpar quality, and unidentified issues or previsions are some ways this expresses itself. Along with these other concerns, there are substantial costs associated with low quality, such as rework, replacement components, and customer-accepted deviations. Profit erosion owing to cash provision expenditures. System change however does not come without its risks, some of these risks are inclusive of cultural change and aversion to change along with the ever growing question around cyber security.

However, System change has benefits, and a key component that makes this kind of quick development and changes possible is the capacity for successful cooperation to increase one another's competence. Thanks to this new method of working, information can now flow freely inside and across departments, which is crucial for ensuring real-time decisions and a smooth transition that enhances the customer experience. There is also advantages when it comes to industry regulators and their requirements for the organisation to store data.

As SGB deploys its digital factory these elements are being interrogated to ensure their viability and how they can change the larger organisation. There is still however still a word of caution, and it relates back to Hoarding, Hoarding is now affecting our digital world, therefore, we must ensure that there are strict rules around the data that is required or at least have the system in place to automatically delete non- required data at a specified period. (Haffenden, 2023) states "A load generated by hundreds of unread emails and text, countless downloaded apps never used".

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