The Role of Frictionless Enterprise in Smart Factory and Digitalized Production

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Abstract: *Enterprises, like all other elements of business today, must streamline and enhance digital experience delivery by making it as frictionless as feasible. Friction manifests itself in the enterprise as fragmented customer profiles, departmental silos, inefficient workflows, shadow IT, sluggish feature deployment, redundant processes, and anything else that obstructs or hinders the customer or user experience. The concept of frictionless, predictive corporate engineering is introduced in this paper, which is based on new standards and tools. This concept was created to fulfill the demands of large, complex organizations that must quickly react to changing threats and conditions. Meanwhile frictionless enterprise giving birth to Industry 5.0. With industry 5.0 manufacturers can cut costs, develop systems that use renewable energy and eliminate waste. It refers to humans working with robots and smart machines, enabling humans to work faster and more efficiently by leveraging advanced technologies. Frictionless enterprise will become the core by implementing its fundamental methodologies such as hyperscale automation, cloud agility, data fluidity, sustainable planet and secure business.*

Keywords: friction, production, industry 5.0, frictionless enterprise, hyperscale automation, cloud agility, data fluidity, secure business, smart factory

1. Introduction

The objective of this research paper is to discuss the role of frictionless enterprise in smart factory and digitalized production. Today's customers are cloud native and consume content in a variety of ways. They don't understand why there are conflicts in the workplace. From a business standpoint, frictions are a problem because they result in higher costs, longer time to market, complexities, and negative consequences such as attrition. Frictionless enterprises focus on assisting customers in providing the same experience to their employees, customers, and suppliers as cloud native people do in the real world. Now let's look at some of the organizational frictions that might develop, as well as some of the symptoms that can be seen in organizations. As they embark on their journey to deliver efficiency, they will face a number of challenges. There is a certain amount of fragmentation. There's an issue. In the procedures, there is a lack of data quality. "Shadow IT" and "technical debt" are terms used to describe all of this. All of these factors combine to produce inconsistency as a result. Businesses must reorganize themselves, unbundling existing operations in order to rebundle them in new configurations more suitable to a connected, digital environment.

2. Description

Significant developments have happened in the sphere of industrial production and development over the last two decades. State and market boundaries have been removed. Globalization as a whole started to take shape, and product demand and supply are higher than they've ever been. Industry 1.0 began with the industrial revolution, the transition to new manufacturing processes, going from hand production methods to machines lasted from the mid-18th century to about 1830. Nowadays utilizing internet technologies, machines can often govern themselves to a large degree, with very little input from human operators. Organizations today facing frictions andchallenges within businessoperations on a day-to-day basisthere are workarounds there are systemsilos there are processes that have beenbuilt up over time that causes a lot ofchallengewe can overcome these with thefrictionless enterprise. It's a newinitiative that allows us to digitallytransform an organizationto take us through to a new world. Frictionless enterprise focuses on how to adopt methods for detecting, preventing, and overcoming frictions in our clients' company activities, resulting in improved business outcomes with a value-oriented approach. It is dependent on some fundamentals like **"Hyperscale automation"** to focus on efficiency, time to market, and quality; **"Cloud agility"** to ensure the enterprise is ready and equipped for change; **"Data fluidity"** to address future frictions; **"Sustainable planet"** to ensure frictions are solved in a global context; and **"Secure business"** to avoid any unintended consequences.

3. The role of Frictionless Enterprise in SFDP

The concept of frictionless enterprise majorly depends on automation and artificial intelligence with collaborative inputs from manual source. For digitalized production under the smart factory before production can start the order isanalysed to derive the materials and theprocesses needed to do the job by a system based on AI. Choose the most appropriatefactory for the order in terms ofavailable capabilities supply chainaspects and the best climate footprint.We envision that companies strive toproduce only what is really requested tobe more economical and to save valuableresources. After analysing the priority of theunloading process intelligent algorithmsallocate suitable resources based ontheir offered skill set and availabilityhuge amounts of data need to be analysedin the production process. Suppose the video stream of a drone thatidentifies the position of the suppliedmaterials and checks the delivery forcompleteness and damageall at the same timehowever not all tasks can be solvedfully automatically human expertise andintuition are still crucial to makecritical decisions in the

autonomousfactory. Intelligence systems are connected exchange information and collaborate tocomplete tasks quickly and efficiently.Tasks such as triggering material transportation with the scanned information the autonomous units knowwhat to do and ensure a smooth unloading process all without complex engineering of eachprocess step. Each autonomous unit offers a set ofskills for the execution of a skill; workflows are generated on the fly byconsidering the environment and thegiven process goal. Variety of technologies is used tosolve complex tasks such as theunloading of a pallet in an automatedway. All automated processes are continuallymonitored by certified advanced safetyconcepts for human machine interactionin rapidly changing environmentsself-adapting safety functions arecrucial to produce efficiently and moreimportantly safely. If a production step cannot be performedby a single production unit theintelligent production system dividesthe process into subtasks, then itassigns production modules to them evenconsidering tool changes andtransportation times. [9]

4. Characteristics of Frictionless Enterprise
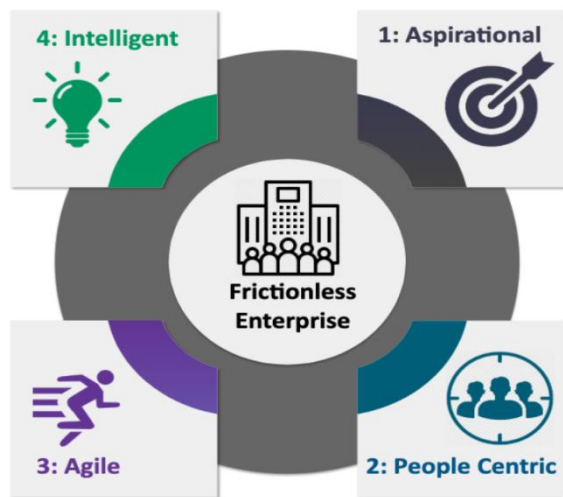
4.1 Aspirational

Growth can only take place in an environment where it is both anticipated and encouraged. Massive change is required for a business to become a frictionless enterprise, the kind of change that causes even the most hardened executive leadership teams to pause. This can only happen if leaders promote and execute an aspirational culture that appears to be unreasonable on the surface. Your company's culture should be focused on reinventing the business, even if it means disrupting your own products and services, and be willing to remove potential sources of friction and constraint. Continuous improvement should be valued, disruption should be embraced, errors should be expected (and forgiven), and progress should be recognised. Being frictionless is much more about the trip as it is about the destination; even if you decrease friction in rapidly increasing, the benchmark for measuring frictionless will continue to move away. [1]

4.2 People- Centric

People are the only reason an enterprise succeeds, and this isn't restricted to the customer or user experience. Examine every area of your company's brand, operations, abilities, and workflows to see how you can make it more enjoyable, transparent, and compassionate. Focus on providing greater value to your employees in order to ensure the long-term viability of your business. [1]

4.3 Agile

The opportunity to modify a business direction, having systems and processes that enable change, capturing and applying meaningful data about your customers and marketplace, early adopters of change, and, perhaps most importantly, leaders who can problem-solve and make decisions quickly are all examples of agility. [1]

4.4 Intelligent

Today's businesses collect huge amounts of data from their activities, including:

a) Data regarding their customers' interactions with the company, such as viewing information on the company website, transacting on the customer portal, or calling/ticketing/chatting with the help desk.
b) Information on their products, services, and special offers.
c) Customer information, both external and internal.
d) Data about how customers interact with their products and services, including via linked devices.
e) Data from a variety of third-party sources.

Data gathering on this scale, as well as the actionable insights provided by it, represents a great opportunity for the frictionless enterprise to accomplish more with less. Processes will be automated, staff will be encouraged to assist customers and one another, business models will be modernised, data assets will be utilised to generate faster results, and all of this will take place with less risk. [1]

# 5. Examples of Frictionless Enterprise in SFDP

5.1 Digital manufacturing

To generate product and production process definitions at the same time, an integrated computer-based system with simulation, 3D visualization, analytics, and collaborative tools is used. [11]

5.2 HR Automation

Human resources automation (HR automation) is a means of employing software to automate and streamline repetitive and time-consuming processes in the HR department. [12]

5.3 Cloud manufacturing
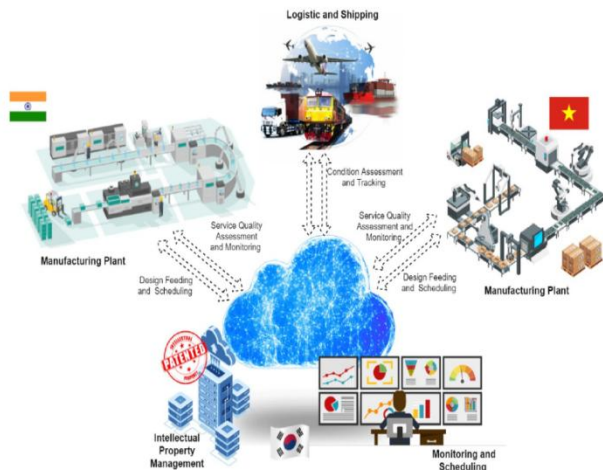
Cloud manufacturing is a novel way to revolutionize the traditional manufacturing paradigm in to anadvanced manufacturing process by integrating latest technologies such as cloud and EC, IoT, virtualizationand service-oriented technologies. In a cloud manufacturing process, multinational stakeholders will collaborate together to operate efficient and low-cost manufacturing process. The distinguishing features of cloudmanufacturing include reliability, high quality, cost effectiveness, and on-demand capabilities.

5.4 Manufacturing/Production:

In the past, robots were used to do dangerous, monotonous, or physically demanding tasks in manufacturing environments, such as welding and painting in automobile plants and loading and unloading heavy cargo in warehouses.As workplace technologies become smarter and more connected, frictionless enterprise aims to combine these cognitive computing talents with human intellect and resourcefulness in collaborative operations.

6. Advantages of Frictionless Enterprise:

6.1 Reduce friction

Organizations may use a frictionless enterprise to not just remove frictions in the process and improve interactions within their company environment, but also to make informed decisions quickly.[10]

6.2 Improve insights:

Understanding and adopting these foundations provides organizations with the opportunity to boost efficiency by avoiding possible challenges and streamlining operations in a positive, meaningful way.[10]

6.3 Bridging the gap:

Helping businesses to focus on the most essential thing - their customers - by bridging the fragmentation that exists between the people, processes, and platforms functioning within their supply chain, and doing it in real time.

6.4 Cutting cost:

Cutting production costs can help manufacturers become more competitive.

6.5 Move on from paper:

The industrial-era company is organized around functional channels that were created to facilitate the internal movement of static documents from one department to the next, carrying the data they require. It's past time to let go of this paper-based legacy.

7. Future Scope in SFDP

a) Workers are empowered as a result of up-skilling and re-skilling, which places them at the center of the industry.
b) Intelligent robotics and systems will have unparalleled access to manufacturing supply chains and production floors.
c) Digital manufacturing may shift away from hosting critical software and databases on third-party servers in the future. Manufacturers who are forward-thinking are already implementing company-owned servers that are managed using proprietary software.

8. Summary

The Frictionless Enterprise makes it possible to take a considerably more proactive approach to operational management and information gathering to support decision-making than possible in the past. Because they have the information needed to respond as efficiently as possible, organizations can become better equipped to make quick decisions. It is a concept that has been designed to consistently harmonize the working space and efficiency of humans and machines. Frictionless enterprise, enabled by a variety of emerging applications and supporting technologies, is expected to boost manufacturing output and customer satisfaction. A number of challenges and open issues were also presented, such as security, privacy, human-robot co-working in a factory, scalability, and skilled workforce, which should be addressed in order to better realize the concept of frictionless enterprise in the near future.

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