Suyati
dream. dare. do

Artificial intelligence

Block chain

IoT

Big Data

A WHITEPAPER ON

How will emerging technologies reshape the manufacturing landscape

Executive summary | Challenges | Solutions | Conclusion | About Suyati

EXECUTIVE SUMMARY

Emerging technologies such as Big Data, Artificial Intelligence, Blockchain and IoT will disrupt the manufacturing space greatly. Enterprises have the option to channel these disruptions positively, to overcome traditional challenges and pain-points, and also to drive innovation.

- Big Data helps the enterprise take data-driven decisions, and identify trouble-points accurately.

- Artificial Intelligence would infuse much-needed flexibility and make the process smarter, taking automation to new heights.

- Blockchain transforms the supply chain through improved transparency. It also facilitates proactive redressal of issues.

- IoT facilitates proactive maintenance and repairs, and powers highly autonomous smart systems.

WHITEPAPER

Technology is in a continuous state of flux. Emerging technologies such as Big Data, Artificial Intelligence, Blockchain and IoT have a big impact on manufacturing. Adopting these technologies will not only help the manufacturing sector overcome many of its traditional inefficiencies and pain-points, but also drive innovation, and allow adopters to gain a valuable competitive advantage.

Challenge #1
THE CHALLENGE OF INEFFICIENCY

The traditional method of factory production is highly inefficient. The conventional manufacturing process is straddled with many uncertainties and opaque processes. Departures from the ideal state are commonplace, and resolutions often require costly and time-consuming shutdowns. Siloed processes, complex and convoluted systems, poor systems integration, and various artificial or avoidable bottlenecks breed inefficiencies. To compound matters, many manufacturers in today's highly competitive environment face pressure on margins. The scope to increase prices and pass on the cost of inefficiencies to the end-customer is no longer an option today, when customers are highly aware of the choices in front of them. The only way enterprises can improve margins is by focusing on internal efficiencies, and by offering better value to customers.

HOW BIG DATA HELPS

Big Data allows manufacturers to delve into internal and external data and make informed decisions in almost all areas, from product development to supply chain, and from materials management to work schedules.

- Subjecting shop floor and associated data to analytics pin-points trouble-spots, enhances process efficiency, and betters product quality in a big way.

- Big data analytics offers insights on the gap between the ideal state and actual state, enabling enterprises bridge the gap in a methodological way.

- Big Data analytics make costing estimates faster. Sales and marketing teams may base their quotes, tenders, and other business development cycles in a highly accurate way, armed with real-time and precise information, and without guesstimates.

- Analysis of customer feedback and sales data enables improving product quality, adding new features of existing products, and launching new products, responding to what customers actually want.

Challenge #2
THE PROBLEM OF BLOAT AND SLOTH

Conventional manufacturing is a capital and resource intensive task. This, coupled with low profits and the pressing need to keep costs low in a highly competitive economy, makes it nonviable to make large investments in automation for most enterprises. Many manufacturers try to do with cheap labor instead, which can lead to costly problems.

Advanced manufacturing involves tasks that need precision, or others that may be injurious to human health and safety; and are therefore, outside the purview of human labor. This is where factories have embraced technology. However, merely embracing technology may not resolve all issues, or even be adequate for emerging challenges.

Many manufacturers do deploy robots, but these are only capable of performing routine, pre-programmed tasks in a very narrow range. Worse, the possibility of a robotic worker accidentally causing harm to a human worker sharing its environment is very real. The rule-based nature of existing autonomous systems makes it hard to co-opt the unpredictable behaviors and actions of humans.
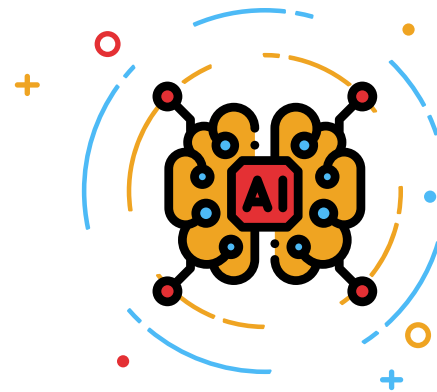
HOW ARTIFICIAL INTELLIGENCE HELPS

Artificial Intelligence (AI) applications enable integration of technology into manufacturing process in a much better way than before. Adopting AI enables enterprises to shed their bloat and sloth, and become lean and mean.

- AI systems equipped with advanced decision-making capabilities improve the scope of automation manifold. Tasks too dangerous for humans to handle or requiring ultra-precision effort may now be wholly entrusted to AI empowered robots or machines.

- AI machine learning offers vast flexibility to robots operating under rule-based programming. AI empowered robots have greater capabilities and can work with human co-workers better.

- Machine learning allows AI-based systems to analyze volumes of data and discern meaningful patterns. The system can learn and improve itself with every interaction, without being programmed for a specific task.

- Smart algorithms analyze vast amounts of data to forecast market demand and adjust the supply chain automatically. This improves efficiency and reduces waste manifold.

AI gives a fillip to predictive maintenance. Rather than servicing equipment based on guesstimates, a combination of AI algorithms and sensors monitor performance and operating conditions in real-time, to predict maintenance issues before they occur.

Challenge #3
THE PROBLEM OF OPAQUENESS

While the top management of an enterprise may value transparency and accountability, actually putting it to task in manufacturing is challenging. Most manufacturers are saddled with sophisticated supply chains, legacy systems, silos, and complicated logistics. For instance, shipping equipment for maintenance is mostly based on the break-fix model. Migrating to a proactive subscription-based model which focuses on maximizing product uptime is a big task.
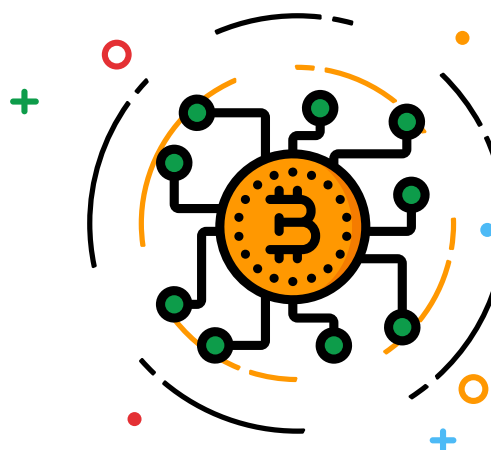
HOW BLOCKCHAIN HELPS

The continually reconciled blockchain data, held in a shared and decentralized database, offers a high level of integrity and transparency to the processes it supports.

Blockchain offers increased visibility into the service supply chain, increasing transparency and finding any issues early. Stakeholders may pinpoint the exact status of parts movement for inventory fulfillment and repairs.

Blockchain offers a secure and transparent way to record transactions and service records. The blockchain records being stored and distributed across nodes in the network makes it near-impossible to falsify records. For example, an automaker releasing a vehicle containing faulty parts may use the blockchain database to trace the supplier of the faulty parts in double-quick time and nip the issue in the bud.

A blockchain solution facilitates a living dossier of activity logs to keep tabs on the flow of goods between companies, offering an extra level of transparency and control to the overall process.

Challenge #4
THE PROBLEM OF SILOS AND DRAGS

Opaque supply chain and silos pose a big drag on manufacturers. Uncertainty about product movement, the time spent to quality-check each product, etc. pose big drags, which can be costly in today's hyper-competitive age.

HOW IOT HELPS

IoT allows a manufacturing plant to work smarter rather than harder.

❖ IoT based visualization tools offer greater transparency and deeper insights into the manufacturing processes, and also provide a holistic view of the functioning of the facility.

❖ IoT enables the "digital twin concept," allowing manufacturers to apply simulations and test the lifespan of a physical asset. It spawns better products for the customer, besides other possibilities.

❖ IoT enables the maintenance team to monitor assets in real-time, predict machine failures, and resort to proactive maintenance. For example, IoT based real-time monitoring offered Tata Power early warning of a bypass valve being open, allowing the company to save about $300,000.

❖ Combining IoT and machine learning enable the development of highly automated smart systems capable of identifying and addressing issues on its own, without human intervention. Florida based Duke Energy has already created a self-healing grid system, which automatically reconfigures itself when power is lost.

❖ IoT sensors and connected devices allow early detection of malfunctioning systems, pre-empting injury to employees.

CONCLUSION

Embracing emerging technologies such as Big Data, IoT, Blockchain and Artificial Intelligence allows manufacturing businesses to grow their revenues and market shares much faster than their competitors. However, much needs to be done, especially on the awareness front. As things stand, about *44% of companies* have trouble identifying IoT opportunities and benefits. The need of the hour is a competent partner who is capable of understanding the business and capable enough to roll out highly intuitive solutions that overcome pressing problems or seize opportunities.

REFERENCE

❖ zdnet.com/article/how-blockchain-can-transform-the-manufacturing-industry/

❖ medium.com/@philippsandner/application-of-blockchain-technology-in-the-manufacturing-industry-d03a8ed3ba5e

❖ hbr.org/1986/09/why-some-factories-are-more-productive-than-others

❖ entrepreneur.com/article/286084

❖ i-scoop.eu/internet-of-things-guide/internet-of-things-in-manufacturing/

❖ digitalistmag.com/iot/2017/12/01/how-manufacturers-can-kick-start-internet-of-things-in-2018-05596795

Suyati

dream. dare. do

Suyati is a fast-growing, digital transformation solutions company that helps you rebuild your customer experience for the digital consumer. We collaborate with businesses to strategize and implement impactful digital initiatives that position our clients ahead of the competition. We are digital-first and we focus on delivering digital transformation solutions that support your various engagement strategies.

Our three-phase approach to implementing digital transformation for you ensures that you win stakeholder support, secure early wins through competitive advantage, and transform your business for future growth. And our tailor-made platform, Mekanate, helps you discover your business DNA from your passive and active data, and use it to initiate, integrate and accelerate your DT implementation.

With our niche and rich expertise in a wide range of technologies and services - CMS, CRM, e-commerce, Cloud, IoT, Data Analytics, and Product Engineering - we help companies across the globe leverage their best on web/cloud/mobile platforms.

Learn more: **www.suyati.com**   Get in touch: **services@suyati.com**