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Start Small, Think Big

Leveraging AI to transform the future of the MSME sector

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Micro, Small and Medium Enterprises (MSMEs) are a significant component of the Indian economy owing to the fact that it is the second-largest employment provider, after agriculture in India. Currently, there are 63 million such enterprises in various industries employing close to 124 million people, accounting for 8% of India's GDP and 45% of merchandise exports. Hence, this sector is justifiably called the growth engine of the nation. The MSME sector in India consists of 99.4% Micro Enterprises, 0.52% Small Enterprises and 0.08% Medium Enterprises. These enterprises are broadly classified into two categories namely,

1. Manufacturing
2. Services

Recently, the Government of India has updated the definitions of MSMEs (see table). The revised definition is thought to be in favor of MSMEs. This is because earlier, firms tried to operate conservatively owing to the fear that if they outgrow the size of what has been defined as an MSME, they would not be entitled to the benefits provided by the government. With the revised definition, they need not worry about growing in size and still avail benefits.

It has been estimated that an investment of one lakh in fixed assets in the small scale sector, on an average generates employment for four people. Besides providing large employment opportunities at lower cost of capital, MSMEs help industrialize the backward & rural areas alleviating the regional imbalances and moving towards uniform distribution of value and wealth.

The current article enunciates the **"applications of AI in MSME businesses"** to significantly boost their performance by anchoring the potential of AI. Before moving on to the applications of AI in various industries of MSME, lets understand the strengths, weaknesses, opportunities and threats these businesses face (see table in the next page).

Why should MSMEs use AI?

The extent of operations and services that can be optimized by AI is immense as it is evolving at a significantly fast pace across domains. Large scale manufacturers and big corporate competitors of the MSMEs are us-

Existing and Revised Definitions of MSMEs

Previous MSME Definitions			
Criteria: Investment in Plant & Machinery or Equipment			
Classification	Micro	Small	Medium
Mfg. Enterprises	Investment < Rs. 25 lac	Investment < Rs. 5 cr	Investment < Rs. 10 cr
Services Enterprises	Investment < Rs. 10 lac	Investment < Rs. 2 cr	Investment < Rs. 5 cr
Revised Definitions of MSMEs			
Criteria: Investment and Annual Turnover			
Classification	Micro	Small	Medium
Manufacturing & Services Enterprises	Investment < Rs. 1 cr and Turnover < Rs. 5 cr	Investment < Rs. 10 cr and Turnover < Rs. 50 cr	Investment < Rs. 20 cr and Turnover < Rs. 100 cr

Strengths	Weakness
• Lesser investment • Extensive support from the government • Capacity to adjust with changing environment	• Lack of adequate and timely access to finance • Obsolete technology hampers production efficiency • Competition with big players in marketing efforts • Designing, packaging and product display
Opportunities	**Threats**
• Programs like "Make in India", "Startup India", "Digital India" open newer markets • New payment systems are enabling hassle-free B2B and B2C payments • Well developed AI, Data Analytics, Robotics, IoT systems that improve efficiency	• Industry 4.0 implies use of high-end technologies by competitors involved in large-scale manufacturing • Regulatory risk and policy uncertainty • Necessity of government approvals and permissions • Patent/IPR accessibility and understanding

ing IoT devices for data collection and bringing value to the data using AI. According to a McKinsey report, Marketing and Sales, Supply Chain Management, Manufacturing are the three key areas where the impact of AI is going to be substantial. They estimate that AI can create $1.2 trillion to $2 trillion across world businesses in Supply Chain Management and Manufacturing. Hence, MSMEs can greatly benefit by using AI in various phases of their activities.

How can MSMEs use AI to up their game?

Manufacturing MSMEs

In this section, we discuss the applications of AI for MSMEs in the manufacturing sector.

Supply Chain Management

For businesses operating in manufacturing and logistics, AI can help enhance their supply chain, ultimately improving the overall efficiency and reducing costs. The diagram (see next page) represents the general supply chain of a company and how AI can help in various stages of it.

Manufacturing Analytics

Analytics for Production

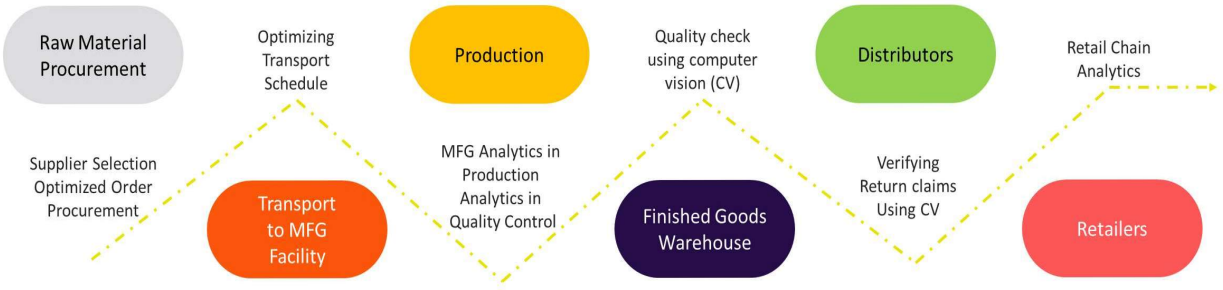
The manufacturing maze encompasses phases such as raw materials, logistics, financing and ultimately packaging the final product. The businesses must manage these whilst dealing with changing consumer demand and facing aggressive competition. Analytics in this process helps in discovering, dissecting the pain points and analyzing key performance indicators such as production quantity, plant downtime, operating costs, return on assets, among others, in order to enhance the production process and meet business goals. Prescriptive analytics in this regard helps maintain balance between several important indices while moving towards a certain common goal, that is achieving profit. However, for this process to happen, data needs to be collected continuously from the equipment. This can be enabled using cutting edge IoT devices which can collect data reflecting the entire manufacturing process.

Using such data, analytics can also be used to do preventive maintenance of the equipment. Predictive analytics can be used to forecast the possible failure of the machine components and take corrective actions.

Analytics for Quality Control

Faulty equipment results in producing products of meagre quality. This amounts to increased return goods thereby causing monetary losses. The quality of the manufactured product depends significantly on the factors and attributes related to manufacturing machines such as engine temperature, spindle vibration frequency, RPM, humidity, etc.

In this context, we discuss briefly how this is brought into action. The first step in this process is collating the data at one place. Data about product quality deviations and equipment maintenance history is collected from ERP/PIMS/DCS systems. This is combined with equipment condition records gathered through a time period (say an year). The combined data set is then fed into advanced AI and ML algorithms, which can then detect causal correlations in the incoming data records. Uncovered correlations are reflected in predictive models, which are then used



to identify combinations of equipment condition and environmental parameters that can lead to product quality issues.

For instance, if we take the example of the pulp processing industry, some of the quality issues include deviations in the concentration of dissolved alkali. The machine learning algorithm, using data from IoT devices detects hidden patterns in the data and states that a higher concentration of alkali stems from a deviation in two process parameters: surged white liquor flow, attenuated processing temperature.

Other Applications

Even though MSMEs are dominated by manufacturing and service firms, they also have to do sales and marketing as a part of their business. Analytics can be used in various stages of marketing like customer segmentation to do demographic based targeting, analyzing customer behavior and designing new products, market mix modelling to analyze the effectiveness of their advertising, customer feedback analysis to improve their existing offerings etc.

Business process analytics is important for bigger firms to establish synergy between their various units. Alex Pentland, in his book Social Physics describes his experiment on how he used behavior data to increase employee productivity in call centers. This is called People Analytics. However, in the case of MSMEs, due to their size such issues do not arise often.

Service MSMEs

We now discuss about how firms that come under this bracket can use AI to enhance their business.

Providing **AI as service** to small enterprises

As described in the previous sections, MSME firms are in dire need of AI to enhance their operations. However, owing to their scale of operations, they often cannot rope in big consulting firms to do the job for them. Hence, the service firms in the MSME sector can offer AI as a service to small scale firms.

AI/Automation on existing projects

Firms that offer software as a service could revamp their applications to include AI capabilities and achieve an edge over their competitors. Also, they can design and launch dedicated AI services for MSMEs as there are very few players in this domain.

In recent times, organizations across sectors are looking for adopting innovations in technology into their business processes to boost up their revenues and establish their brand value. Accenture, in their analysis, have stated that investments by certain firms in AI are expected to increase their revenue by 30% over the next four years. Hence, MSME firms should also adapt to this thriving technology in order to compete against the large corporations. They can establish relations with academia most of which, especially the big universities which have extensively included AI programs ino their curriculum. This will therefore establish a win-win situation for both. Also, they could enter into a contract with their current SaaS providers.

There is a scope for newer companies to enter into this field and provide tailor-made AI services to firms and businesses operating in domains ranging from manufacturing to sales and marketing. This will significantly generate revenue and employment opportunities whilst helping several communities achieve their economic goals.