CIO100 + REIMAGINEERING INDIA 2020
SYMPOSIUM & AWARDS CEREMONY

THOUGHTPAPER | MANUFACTURING
The Role of Analytics

EXECUTIVE BYTES

KAPIL PAL
APAC Head-IT
Service Operations of
LafargeHolcim Group

"It is important to bridge the gap between IT and OT. Experiment in areas that have untapped potential-like manufacturing, maintenance, quality and inspection. Build a Center of Excellence for the same. This would be the best use of analytics- the convergence of business and IT."

M VENKATESHWARLU
Joint GM-Corporate IT
of Larsen & Toubro

"The real untapped potential for analytics is in the shop floor - Maintenance, manufacturing, quality and inspection. Pay focus on that area as it's all about how efficiently you run your plant and machinery."

BEENA NAYAR
Head-IT of
Forbes Marshall

"Data analytics can be used as a disruption to increase efficiency, reduce cost and scale, and non-traditionally for hiring too."

IT leaders and CIO's discuss on how companies can gain actionable insights using analytics in manufacturing industry at CIO100.

ANALYTICS IN MANUFACTURING
BRIDGING THE GAP BETWEEN IT AND OT

As manufacturing sector comes to terms with analytics, CIOs mull over breaking the data silos, tackling counterfeit data and exploring the area with the most untapped potential for the technology—the shop floor.

Innovation with technology is growing today at a faster rate than ever anticipated. But the burden of keeping pace rests majorly with the manufacturing industry. Also, with the advent of globalization and integration, the manufacturing industry is pressurized to make quicker decisions and boost performance. Analytics is the savior in the situation.

Traditionally, as manufacturing sector took to analytics, the latter

CIO FROM IDG

IDG

EXECUTIVE BYTES

SURESH IYER
CIO
Blue Star

"Predictive analytics helps us avoid downtime, minimize number of incidents and therefore is directly related to enhanced customer experience."

DEREK LOPEZ
GM-IT
United Breweries

"When implementing analytics IT leaders do have a shadow of doubt. The major hurdle is people are insecure to share the data as they fear losing their jobs and importance in the organization."

BHUPENDRA PANT
CIO & VP-IT
Welspun Corp

"Analytics can help predict the failure in machinery and maintain the quality."

was applied in divisions like supply chain management, sales and product development. In recent times though, analytics has taken up newer roles in the enterprise in manufacturing sector.

Chief Information Officers (CIOs) are applying analytics to sophisticated tasks - predicting accident patterns, understanding machine effectiveness, gain insights into demand forecasts to guide production chain better and so on. This interest can mainly be attributed to the inclination of IT leaders to reimagine the sector and future proof the enterprise. Also, with the Government of India's initiatives like Make in India and Digital India making rounds, CIOs are convinced that the time is right to tread futuristic waters.

But the road is set with fears. There is always a fear of security, data accuracy, exposure, counterfeit data and cost associated with acquiring the data for an analytics drive. Then once you acquire the data, there is the question of storing it, and encryption concerns follow. Also, change management looms high on a CIO's head with any new implementation, and analytics is no different.

The CIOs haven't lost sight of innovation even amidst these fears.

The momentum is alive with ideas like manufacturing intelligence, preventive maintenance, inspection and quality.

In this thoughtpaper, IT leaders from top enterprises of India provide insights into the growing importance of analytics in manufacturing, how to turn disruption by analytics to their advantage, treading fear with initiatives like Centers of

Thanks to analytics, the predictions of machinery failure on the shop floor can be analyzed in real time. Two things are at play here: Real time monitoring of how the equipment is performing and predicting how long it will survive. One is reporting, and the other is survival analysis-the chance that the equipment can fail.

Excellence, and applying the technology to niche divisions for better production, insights and business growth

Predicting failures and integrating data silos

The primary step towards innovation is accepting disruption and converting it into empathy. When enterprises are suggested analytics, many mull over product demand forecast and sales patterns made easy. But IT departments are way ahead in the usage. And this disruption can be beneficial in multiple ways, says Beena Nayar, Head-IT at Forbes Marshall. "Data analytics can be used as a disruption to increase efficiency, reduce cost and scale, and non-traditionally for hiring too," she says.

Analytics can also cause disruption in the maintenance of your inventory. In fact, Blue Star is already a step ahead in converting disruption to its advantage by combining machine learning. Blue Star manufactures commercial units to cool banks, malls and airports. IoT enables data collection from chillers, which highlights possible issues before it even happens.

The device learns from issues that happened in the past, predicts what could happen and sends an engineer down to the site if repair is required. "This helps us avoid downtime, minimize number of incidents and is directly related to enhanced customer experience," says Suresh Iyer, CIO of Blue Star.

Another way enterprises can break the status quo with analytics is by enabling each department to make something as simple as a status report on its own, says M Venkateshwarlu, Joint GM-Corporate IT of Larsen & Toubro. "In the past, analytics meant IT department could create a dashboard. Now with self BI tools, every department can derive meaningful, informative reports without IT dependency.

Acquiring the right data and securing it

When implementing analytics, IT leaders do have a shadow of doubt. There are several issues behind this. "First, people are insecure to share data. People fear

losing their jobs and importance in the organization," says Derek Lopez, GM-IT of United Breweries.

Also, with sensitive data at stake, data security is a constant fear for IT leaders. Traditionally, data was controlled by only top hierarchy in the enterprise. However, now there are sophisticated encryption measures at their disposal, but cybercriminals have also become creative. Sophisticated attack methods and looming insider threats can't let a CIO rely on the information security methods of yesterday.

A clean and consistent data set is a dream to work with. But acquiring it is a nightmare. The best and quicker decisions can only be made with the right user data. Also, with half-baked data and counterfeit data the outcomes can never be trusted, ultimately defeating the

How to determine if your organization needs a CoE for analytics:

- First analyze the maturity of the organization and the vision of the leadership. Know how the top management wants to use analytics for the organization.

- Do a skill assessment. If the team lacks the necessary skill sets, ensure programs to make sure the employees get to that level.

- Make sure you have the necessary tools and technologies at your disposal.

-Anil Arora
Principal Data Scientist, SAS

purpose of instilling confidence in a data-driven culture.

The cost of acquiring data, its operation and overall management is too high. The data scales quickly, and hence one has to adhere to the standard security compliances, update disaster recovery and upgrade skill management. This eventually leads to an expensive implementation.

Certain fears have to be assessed, which when converted to advantage can lead to 'wow' moments in the enterprise. "Similarly, the thought 'what if' data enters into the wrong hands led to stronger compliances and security laws being implemented, to protect the data from competition and all kinds of threats," says Kapil Pal, APAC Head-IT Service Operations of LafargeHolcim Group. Additionally, enterprises can create proper access controls, data masking and enable role-based access.

Centers of Excellence (CoE) have made foray into other industries, but not manufacturing. Previously known as R&D divisions in the manufacturing sector, centers of excellence work on proof of concept - pilots are rolled out, showcased and tested before floating it as a viable idea.

In the past, manufacturing industry relied more on instinct, less on data and mostly on domain knowledge. But times are changing, says Pal of LafargeHolcim. "Today, domain knowledge is important to analyze

and work on the right data, and combining it with a CoE is a powerful tool in the manufacturing sector," says Pal.

Summarizing the entire concept, Anil Arora, Principal Data Scientist of SAS, gives a quick breakdown on how to determine the organization can have a CoE:

• First analyze the maturity of the organization and the vision of the leadership. Know how the top management wants to use analytics for the organization.

• Do a skill assessment. If the team lacks the necessary skill sets, ensure programs to make sure the employees get to that level.

A clean and consistent data set is a dream to work with. But acquiring it is a nightmare. The best and quicker decisions can only be made with the right user data. Also, with half-baked data and counterfeit data the outcomes can never be trusted, ultimately defeating the purpose of instilling confidence in a data-driven culture.

• Make sure you have the necessary tools and technologies at your disposal.

Bridging the IT and OT gap

Learning, unlearning and relearning is a major part of implementing analytics, says Pal. There are several untapped areas in manufacturing where analytics can be implemented.

Manufacturing integration intelligence by connecting all your shop floor machinery is another methodology to future-proof the enterprise with analytics. "Integrating all manufacturing machinery to get data online and effectively utilize the machine will be the norm. This would help in increased efficiency of the shop floor and keep up with the market demand," says Venkateshwarlu.

Enterprises are already implementing analytics-based projects and are reaping benefits from it too. For instance, at Blue Star, the company was able to predict an event called gas leak in the AC, due to the data collected from the device. "Using the data, we can predict exactly when it will happen and the reason for it. We can prevent gas leaks. This not only saves customer money but also reduces downtime," says Iyer.

Pal mentions that analytics can help review the need for maintenance and its progress. This would reduce the frequency of shutdowns for shop floor maintenance, which is

normally recommended by the manufacturers from twice a year to just once. The maintenance done at one go can be distributed across the whole year if needed.

Thanks to analytics, the predictions of machinery failure on the shop floor can be analyzed real time. Two things are at play here: Real time monitoring of how the equipment is performing and predicting how long it will survive. One is reporting and the other is survival analysis- the chance that the equipment can fail.

Additionally, we can make sure that there is a seamless connection with the vendor. The moment there is a shortage, there is a trigger and things get supplied and rectified," says Beena Nayar of Forbes Marshall.

In the past two decades, most of the IT improvements and application of analytics have been done in the area of supply chain, sales and distribution, logistics and finance.

"But today, the real untapped potential is on the shop floor - Maintenance, manufacturing, quality and inspection. Analytics can be applied to derive insightful data from the vendor's test certificates or during stages of in-house product manufacturing.

"These are untapped areas which really need to be improved. Pay focus on that area as it's all about how efficiently you run your plant and machinery," says Venkateshwarlu of L&T.

Hence, it is important to bridge the gap between IT and OT. Experiment in areas that have untapped potential- like manufacturing, maintenance, quality and inspection. Build a Center of Excellence for the same. "This would be the best use of analytics- the convergence of business and IT," explains Pal ∎

Panelists

2018 CIO100- MANUFACTURING | ANALYTICS

Anil Arora, Principal Data Scientist, SAS

Beena Nayar, Head -IT, Forbes Marshall

Kapil Pal, APAC Head– IT Service Management & IT Operations, Holcim Services

Bhupendra Pant, VP & CIO, Welspun Corp

Manikkam Subramaniam, Senior VP, Heritage Group

M Venkateshwarlu, Joint GM- Corporate IT, Larsen and Toubro

Suresh Iyer, CIO, Bluestar

Derek Lopez, GM-IT, United Breweries

Anirban Sinha, Head -IT, L&T Metro Rail

Key
Takeaways

The 4 mantras to innovate with analytics in manufacturing

1. Breaking the status quo: Give every department powerful BI tools to reduce dependence on IT. Break the data silos.

2. Break the loop of fear: Focus on finding the right data and using cybersecurity to eliminate data theft and counterfeit data.

3. Find your 'what if' moment: Experiment on building models that will help you improve the quality of your data set. Centers of Excellence is the way to go about.

4. Keeping the innovation momentum going: Explore the untapped areas of manufacturing. Use analytics in quality and inspection, manufacturing in-house products and maintenance of the plant.

Analytics in Manufacturing

Across industries, the application of advanced analytics, machine learning, and artificial intelligence is disrupting traditional approaches to manufacturing and operations.

The manufacturing sector will see more disruption within the next five years than it has in the past 20.

Manufacturers will need to shake up their business models, their approaches to competitors, and the very core of their businesses to hold their own, let alone grow, in the face of a disruptive onslaught.

Disruption, though, does not have to be bad news - companies that can capitalize on it have incredible opportunities, and disruptive forces will raise revenues in all these industries.

Most manufacturers have already made the most obvious changes to streamline their operations, using traditional methods and business rules to extract maximum productivity from their plants and industries.

However, what they still need is to reap the maximum benefit from their biggest asset – DATA.

The processes are generating huge amount of data but that needs to be captured efficiently for analytics purposes.

Now, thanks to cheaper computational power, from ease of capturing data through various sources -structured or unstructured (in the form of documents, images, videos) to the extent of doing complex analysis using machine learning, deep learning algorithms, manufacturers can really put their data into action.

By putting advanced analytics in action, manufacturers can get real insight into their business, which they were probably never aware of.

Anil Arora
Principal Data Scientist, SAS

These could be identifying reasons for a particular product failure, unprofitable production lines and more importantly taking predictive actions to even prevent products' failure and rather take pro-active measures to avoid any downtime.

In particular, predictive maintenance analyzes the historical performance data of machines to forecast when one is likely to fail, limit the time it is out of service, and identify the root cause of the problems. With manufacturers on a spree of expanding business, it ultimately results in more machines that need to be looked after, which further

results in pressure of ensuring the machines are up and running most of the times.

By utilizing artificial intelligence and making the model learn and refine itself, as the data grows, manufacturers can potentially reduce the downtime by 40 to 60 percent.

This has double fold advantage. One being machine lives get longer, and the satisfaction of the end customer increases exponentially.

Leading companies are now looking at disruptive technologies for their next horizon of performance improvement.

Many are starting to experiment with technologies such as the Industrial Internet of Things (IIoT), artificial intelligence (AI), machine learning, advanced automation, robotics, and additive manufacturing.

"Advanced analytics tools alone will not magically transform process manufacturing. The value of these new tools is only realized when they complement human skills and expertise."

The impact of this shift is expected to be so transformative that it is commonly referred to as the fourth industrial revolution, or Industry 4.0.

Few organizations are in the process of embracing artificial intelligence applications for health safety of their employees. Using image analytics organizations can identify if the worker is with a hard hat or not.

> "These new approaches make it possible for manufacturing professionals to engage in more fact-based discussions, comparing the real impact of different parameters on business outcomes before making decisions and, in many cases, to consider counterintuitive actions that might improve productivity or profitability."

They can continuously monitor the worker's body temperature, heart rate and level of activity correlated with external sources of temperature and humidity.

And use these data points to identify the most optimal type of work a worker should be engaged in. As another example of artificial intelligence being used in the manufacturing process of the automotive sector - A well known German company headquartered in Bengaluru, has 14 manufacturing plants across India. At its headquarters, it uses real-time data to reduce "throughput times for the calibration of pumps for tractors".

With the help of real-time monitoring, it is now possible to avoid manufacturing downtime and improve productivity.

In an increasingly complex manufacturing environment, this ongoing data-driven transformation can enable companies to dynamically optimize their tactical planning and make better strategic decisions for the long term. However, advanced analytics tools alone will not magically transform process manufacturing.

The value of these new tools is only realized when they complement human skills and expertise.

These new approaches make it possible for manufacturing professionals to engage in more fact-based discussions, comparing the real impact of different parameters on business outcomes

> "Applying advanced analytics to manufacturing operations requires a combination of relevant tools, data scientists, advanced analytics platform specialists, and manufacturing subject matter experts as well as people who can serve as liaisons between these various constituencies."

before making decisions and, in many cases, to consider counterintuitive actions that might improve productivity or profitability.

As an ending note, applying advanced analytics to manufacturing operations requires a combination of relevant tools, data scientists, advanced analytics platform specialists, and manufacturing subject matter experts as well as people who can serve as liaisons between these various constituencies.