Role of **IoT** in **Forging Industry**

Smart Manufacturing

Real time Shopfloor Visibility

THE FORGING INDUSTRY - TODAY

The fundamental issue with forging industry is its mindset of operating 24 x7 to maximize production output. Majority of the forging companies see that they run all the lines for all three shifts. The industry measures its capacity in metric tons irrespective of what's its real capacity. The habit of measuring capacity in metric tons (MT) undermines the overall equipment effectiveness. In below paper, we will highlight current challenges faced by the forging industry and how latest technology bring opportunities for higher business goals with lesser capex.

TIME TO LOOK AT 'TIME' AS A MEASURE OF CAPACITY

Referring to AIFI report, "The industry believes its capacity is 3.77 mMT." However this is only the installed capacity. Mere by running machines 24 x 7 (three shifts), factories cannot achieve full capacity. Often there are pockets of downtime, underutilization or non-utilization of installed capacity, and issues with OEE that affects the real capacity. Its high time for the industry to change its definition of capacity from metric tons to time based.

Time to look at 'TIME' as a measure of Capacity

The lack of real time insights into shopfloor hampers timely and informed decisions making

CHALLENGES FACED BY FORGING INDUSTRY

The Forging Industry is passing through a challenging phase. Though the Indian Forging Industry has emerged as major exporter to the manufacturing sectors and is increasingly tapping opportunities as **suppliers to global automotive OEMs**, lack of expenditure on R&D and new technologies have led to inefficient economies of scales (hence low productivity).

The Poor automation and **absence of technology upgradation** in the areas of tooling, forging process, heat treatment, quality verification & process technology has affected in terms of reduced operational efficiency and lower capacity utilization, particularly for prospects in global markets.

While the business community is poised to benefit from the recent government initiatives like 'Make in India' and 'Skill India', the technological innovation will be the driving force for **higher standard quality products** and **greater export share of production**.

TECH ENABLED INNOVATION - A MUST FOR FORGING INDUSTRY

The term "digital" is nothing new. But most traditional forging companies lack the required infrastructure and the roadmap. The large (capacity above 30,000 to 75,000 MT) and medium (capacity above 12,500 to 30,000 MT) enterprises have multiple assembly lines with diverse set of machines, robots and conveyors, across plants. And most executive teams fear a technology upgrade would not only replace their current hardware but also add to a major capex.

Often these heterogeneous devices communicate on different protocols and give rise to islands or 'data silos'. The lack of real time insights into shopfloor hampers timely and informed decisions making. Such lagged decisions could lead to suboptimal asset utilization, higher inventory and maintenance costs, and reduced throughput.

A **single source of truth** – Real time visibility in shop floor activities and common data source from shop floor to top floor is a game changer.

INDUSTRIAL AUTOMATION | ROLE OF IOT FOR GLOBAL COMPETITIVENESS

To put the industry back on the growth track in both the domestic and international markets, sustainable competitive advantage through technological advancement is the key.

While the hype around Industry 4.0/IoT may have subsided, the impact is only picking up magnitude. And with this Industry 4.0 industrial revolution, the inexpensive wireless sensor technologies – the Internet of Things (IoT) for real time business insights, shop floor visibility, improved asset utilization, remote monitoring, predictive maintenance, condition based monitoring and much more have only fuelled the demand for what is now conceptualized as 'Smart Manufacturing'.

HIGHLIGHTS

HIGHLIGHTS

Siloed Data Islands

No realtime visibility into Shopfloor

Lagged decision making

INNOVATION & TECHNOLOGY |THE USE CASE OF A LEADING GLOBAL METAL FORGING COMPANY

To understand benefits of IoT implementation by similar organizations in the Forging Industry, we present a case study with best practice IoT scenarios:

Why IoT: One of the Leading Global Metal Forging Companies was struggling with low OEE (Overall Equipment Effectiveness), Low Manpower Productivity, and out of proportion Energy costs. The company wished to have greater visibility in the shop floor and analyse the data to identify issues and plan improvement areas to predict outcomes and increase overall throughput.

CHALLENGES

As we conducted conducted our IoT Readiness Assessment (functional and technical), we found following on ground challenges at the outset:

1. **Disconnected** Heterogeneous Devices: The customer had multiple SCADA systems across all their assembly lines with diverse set of machines, robots and conveyors. The assembly lines consisted of heterogeneous machines, a majority of which were not connected.
2. **Manual Data** Entry: Most of the shop floor machine behavior and production data was manually compiled resulting in delays, inconsistency, and inaccuracies. Not to mention, no realtime visibility into plant operations.
3. **No Single Source of Truth:** Due to lack of single data repository, the plant managers found it very difficult to extract the data across these systems and present a unified view of production and efficiency data.
4. **Islands of Data:** The shop-floor (operational data) was isolated from the rest of the IT network in the organisation. The existing complex network topology made it a challenge for systems to talk to each other.
5. **Limitations to Scalability:** Connecting additional machines would result in a humongous growth of data. The existing SCADA systems would not scale to this data growth which meant that there were limits to the amount of real-time and historical data that these systems could handle.
6. **Absence of Condition Based Maintenance** - Absence of online quality control and No real time monitoring and hence no real time insights into machine critical parameters which impacted the ability to proact on issues that may arise on shop floor.

SOLUTION

Identifying the business objectives and existing process and technical gaps, Altizon created a IoT project framework for digitalization. With its Altizon's **Datonis®** IoT platform, the company kick-started their digital transformation.

HIGHLIGHTS

IoT Enabled Innovation

Realtime visibility

Proactive planning

Informed Decision making

22% improvement in OEE

Average reduction of **5 shifts** per month

Datonis® connected with all their diverse devices and heterogeneous machines across lines. Soon the data started flowing into single cloud based repository providing Single Source of Truth. It would then process this data in real-time or on a scheduled manner to provide much needed insights into machine downtime, resource utilization, and energy consumption.

During Measure phase, all the data was sanitised, tuned and a baseline was established. Altizon team then worked with management to analyse the data and set improvement targets.

With realtime visibility into shopfloor data, management identified top priority issues and created a project charter to address these issues -

Contact time loss - The company found that Under unplanned downtime, 'Unknown reason' was a major contributor. Machine operators needed training and guidelines on shopfloor behavior and activities to ensure optimal machine utilization. Punching in proper reason codes gave true visibility into shop floor activities helping management to address behavioral, procedural, or technical issues.

Material Movement and Setup time - Management also realized time loss due to improper material planning and other technical issues. They initiated twice a week planning and replanning program to ensure material is available on time. They also trained operators to arrange for tools and support units to reduce setup time

BENEFITS ACHIEVED

With realtime insights, now shopfloor operator to top floor management, everyone has single source of truth. In less than 12 months of IoT implementation, the company achieved **22% improvement in OEE** and was able to **reduce average 5 shifts per month**. This also resulted in direct savings on energy consumption.

CONCLUSION

As seen in above case study example, real IoT benefits occur when a forging company can achieve higher throughput at reduced total factory hours. Forging companies can achieve higher OEE and same time reduce number of shifts they run thereby achieving significant gain on energy savings and improvement in bottomline. IoT based technological innovation is pushing the boundaries. Its high time for forging industry to redefine their capacity in TIME dimension and not in metric ton. Are you ready for the change? Get ready!

ABOUT ALTIZON

Altizon is the creator of the Datonis® Enterprise IT-OT Grid by enabling an Intelligent Connected Ecosystem for the Industrial Internet of Things. We enable digital transformation in enterprises by accelerating Smart Manufacturing initiatives, modernizing Asset Performance Management and pioneering new Business Models for service delivery. The Datonis® IIoT platform, accelerates IT/OT integrations by helping quickly connect diverse industrial assets and launching new applications over a hybrid infrastructure with edge computing, advanced in-stream, an application development framework and Deep Learning capabilities. A set of ready-to-go Apps, Enterprise Integrations and Data Services for Operational Intelligence, further accelerate enterprise outcomes. With a global footprint of over 100 enterprise users, Altizon is a leading Industrial IOT platform provider as recognized by Gartner and several other analyst firms like Forrester and BCG. An award-winning company, Altizon, is also an alum of the Microsoft Accelerator. For more info: www.altizon.com

CONNECT EVERYTHING

Connect Seamlessly

Collect & Transfer Data Securely

Manage Devices

OWN YOUR DATA

Create visualizations

Build applications using API'S

LOB Integration

PROCESS EVERYTHING

Define structure

Generate alerts & notifications

Store data securely

DEPLOY ANYWHERE

SaaS model

Cloud hosting & support

Private cloud/On-premise

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