

IIoT in Manufacturing

Problems, Metrics and Benefits

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Industrial IOT

Profit from Connected Machines

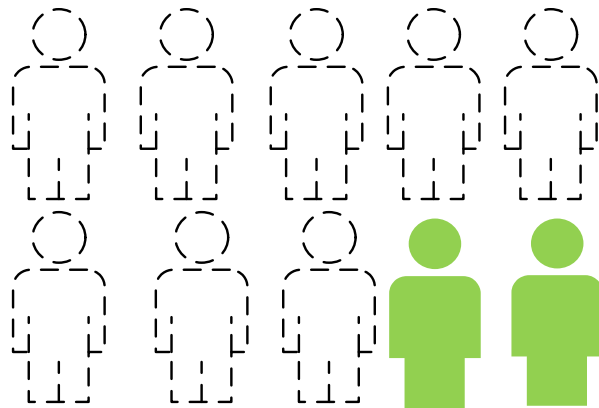


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Automated Oil Production – Cairn Oil

Capacity
Utilization

90%



80%

Reduction in
onsite workforce

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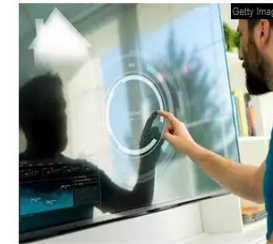
Auto News / Latest Auto News / Industry

Automation key to post-pandemic production

Several companies like Tata Steel, Ceat Tyres, Maruti, Mahindra, Toyota, Tata Motors have big plans to automate their production lines.

Rica Bhattacharyya & Lijee Philip • ET Bureau • April 27, 2020, 08:13 IST

ETAuto



"Foundry and machine shop areas are getting automated," says Ashok Taneja, managing director, Shriram Pistons.

MUMBAI: In the months before the pandemic, Cairn [NSE 0.81%](#) Oil's Barmer plant was managed by over 7,500 personnel on site. After the lockdown was announced, this number dipped to just over 1,500. Despite this, the oil and gas major recovered 1.6 lakh barrels of oil every day, as against 1.8 lakh barrels earlier. This marginal dip too, according to Cairn, is because of lower demand and not because of depleted workforce.

Cairn has been keeping up production solely due to its investment in automation and digitisation over the past two years. "In the post Covid-19 world, focus has shifted to cost optimisation, the only place companies are willing to invest is in automation," says Anand Laxshmiarahan, chief digital officer, Cairn.

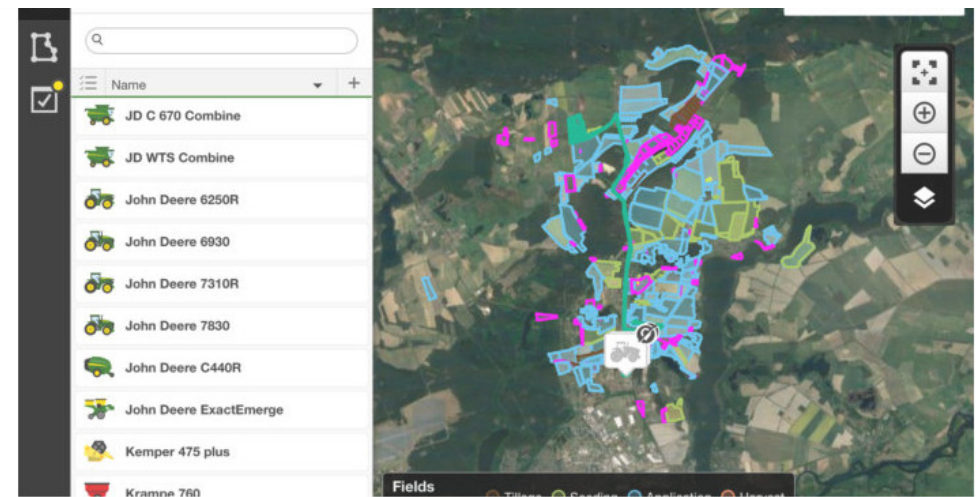
<https://economictimes.indiatimes.com/news/company/corporate-trends/automation-key-to-post-pandemic-production/articleshow/75395665.cms>

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Sensorised Agriculture – John Deere's MyJohnDeere.com

"Easily and securely collect machine and agronomic information"

- Track Equipment Location
- Track Fuel Consumption
- Track Spares Required and Order
- Track Yield
- Track Weather
- Track Soil Condition



John Deere launches new web portal which enables remote management of machines

BY TOM STONE ON 2ND JUNE 2020

CONNECTIVITY

<https://www.ivtinternational.com/news/connectivity/john-deere-launches-new-web-portal-which-enables-remote-management-of-machines.html>

Investment

- John Deere –
 - R&D spend in 2019 - ~\$1.70 Billion.
 - Majority in New Tech
 - Even 0.5% would be \$8.5 Million (Rs. 65 Crores)

<https://www.statista.com/statistics/466569/research-and-development-spending-of-john-deere/>

- Cairn –
 - An industrial robot costs Rs. 15-30 lakhs
 - Automation of a production unit can cost between \$500,000 and several millions of dollars.
 - We can assume that they would have spent at least Rs. 4 crores



Question:

How do they decide where they would want to put their money?

Agenda

Problems

Key Metrics

Some Cases

The Intangibles

Q&A



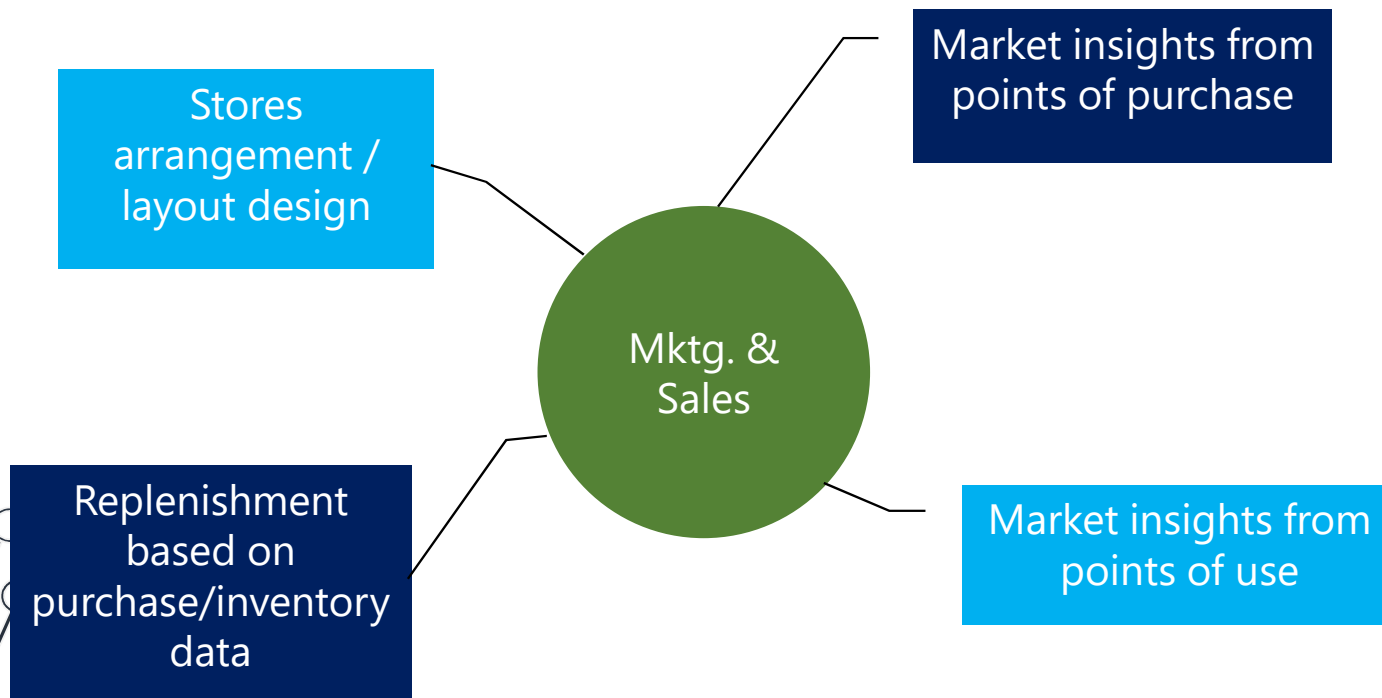
Problem Areas & Key Metrics

Manufacturing Value Chain



Marketing & Sales

What You Can Do With IoT



What You Can Improve

Increase

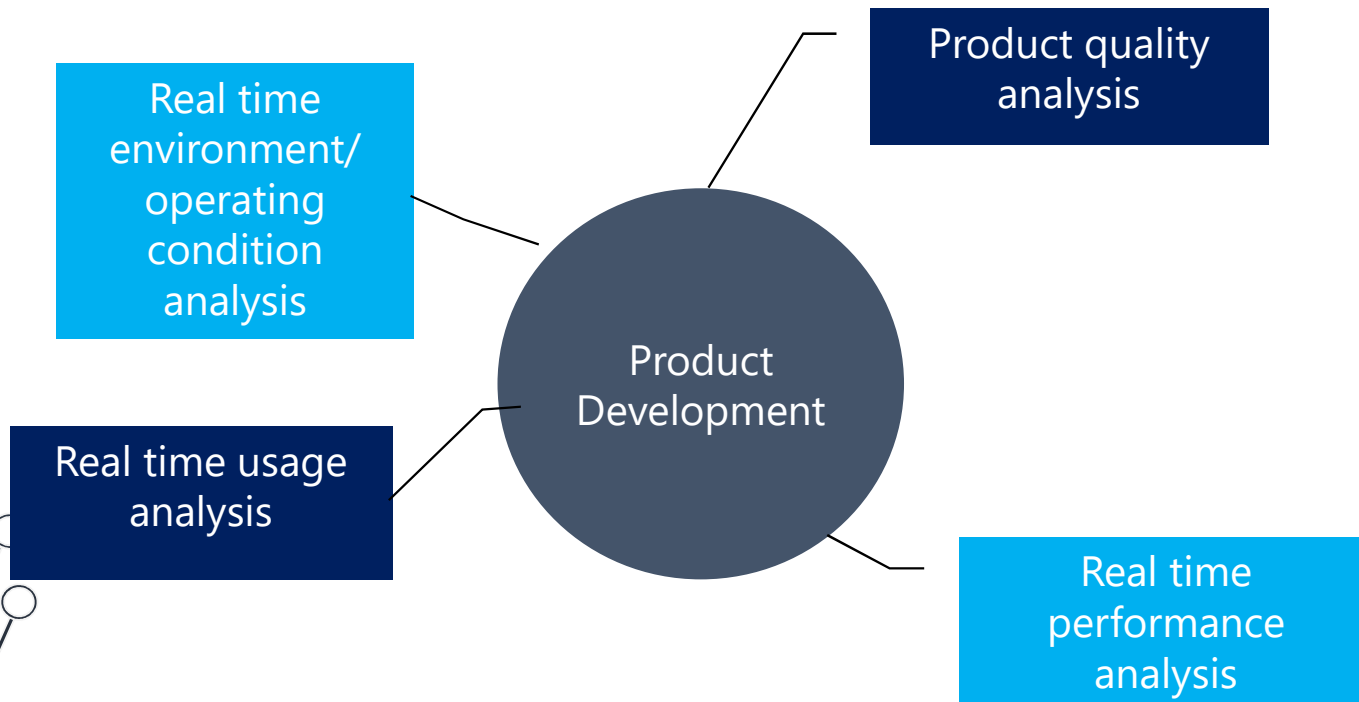
- Retention rate
- Customer Lifetime Value
- Up-sell/cross-sell revenue
- Percent profit from new products/services
- Market share
- Customer satisfaction

Reduce

- Excess Inventory
- Obsolescence
- Stockout costs

Product Development Area

What You Can Do With IoT



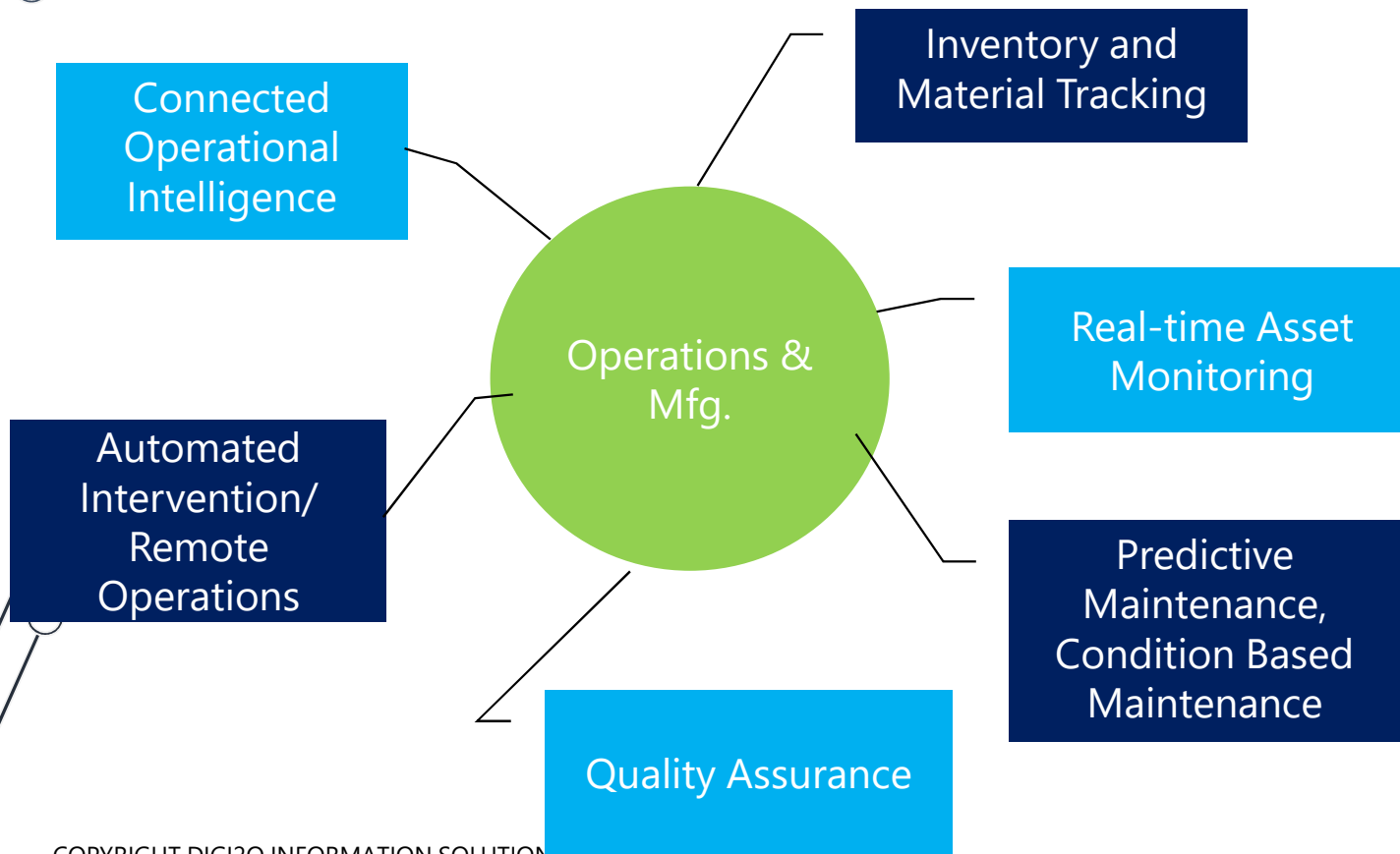
What You Can Improve

- Increase
- New Product Intro
 - Customer satisfaction
 - Product quality

- Reduce
- R&D Expense
 - Development Cost
 - Time to market
 - Returns - New
 - Service cost - New
 - Warranty cost - New

Operations and Mfg. Area

What You Can Do With IoT



What You Can Improve

Increase

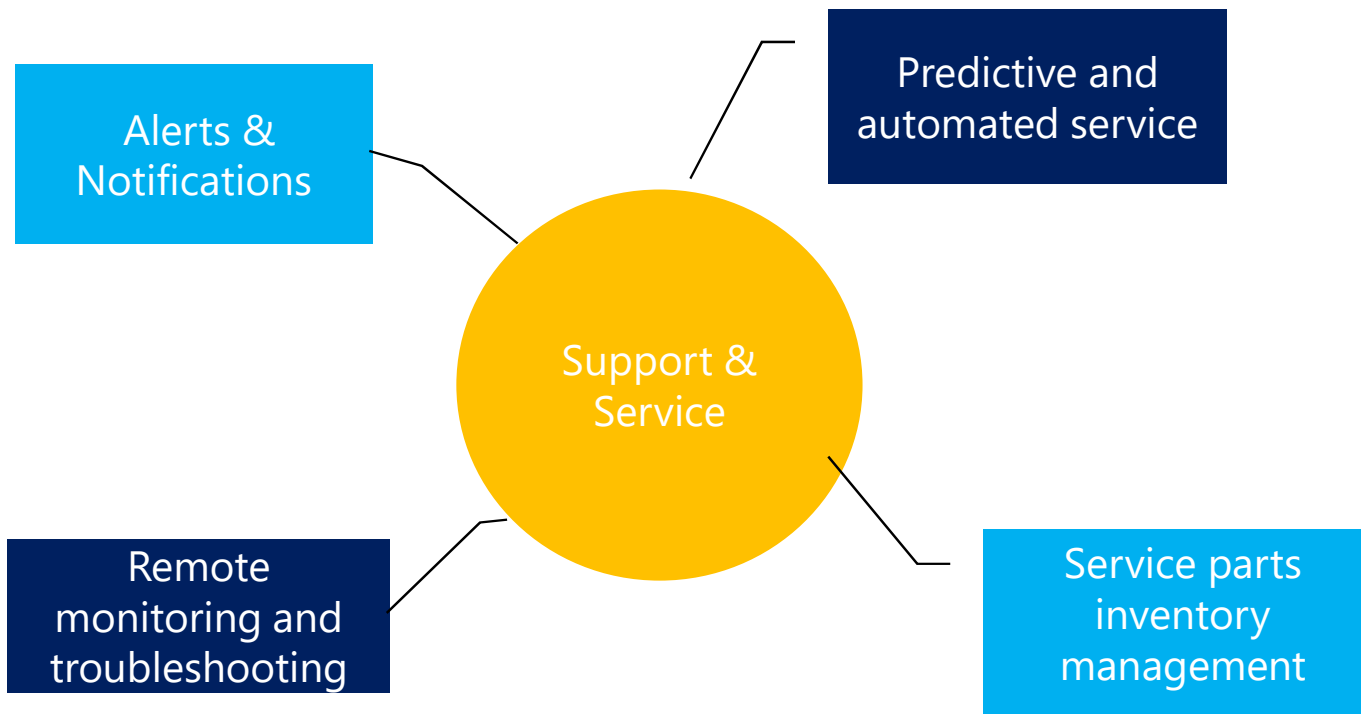
- Quality
- Availability and uptime
- OEE

Reduce

- Inventory costs
- Cycle time
- Returns/Complaints
- Manufacturing cost
- Recalls
- MTBF/MTTR/FTFR

Support and Service Area

What You Can Do With IoT



What You Can Improve

Increase

- Availability; uptime
- Customer Lifetime Value
- Customer satisfaction
- Product quality

Reduce

- Service cost
- Warranty cost
- First time fix rate
- Complaints
- Response time
- Resolution time
- Returns



Some Cases



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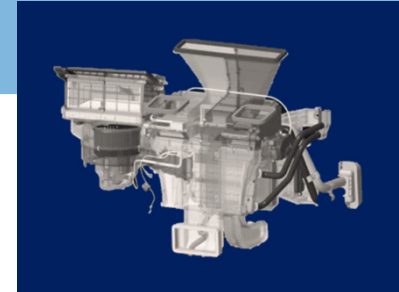
Reduced Field Test Costs of Auto HVAC

Company – Auto HVAC Manufacturer

- Replaces large and expensive data loggers with cost-effective Internet enabled device for field trials
- Eliminates the need for presence of engineer in vehicle for field trials
- Engineer now available for other productive tasks

Benefits Calculation

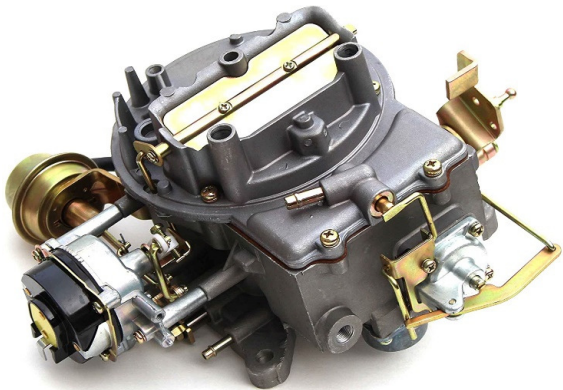
- Travel - Recurring
 - Engineer travel days/Yr – 120
 - Cost/Day – Rs.3500.00
 - Savings on travel – **Rs.4 Lakhs/Yr**
- Opportunity Cost – Recurring
 - Engineer Cost/Hr – Rs.400.00
 - Appr Hours Saved/Day – 3 Hrs
 - Total Hours/Year – 360 Hrs
 - Appr Savings – **Rs.1.5 Lakhs/Yr**
- Capital Cost – One Time
 - Appr reduction – **Rs. 10 Lakhs**



Reduced Costs of Testing

Company – Carburettor Manufacturer

- Automates all manual tasks for testing carburettors
- Reduces manual work significantly



Benefits Calculation

- Cost/Hr
 - Engineer – Rs. 300.00
 - Machine – Rs.1500.00
 - Other – Rs. 500.00
- Rs. 2300.00
- Increase in Output – 20%
 - Savings/Hr – Rs. 460.00
 - Hrs/Yr – 4500 (2 shift basis)
 - Total Savings (Recurring) – **Rs.2.1 Lakhs/Yr**

Improved Quality of Vehicle Electrical Circuits

Company – Automobile Manufacturer

- Automated electrical circuit analytics
- Ability to test circuits in about a minute and provide accurate results
- Usability in all places: receiving insp., assembly line, service centres

Benefits Calculation

	Cost Element	Reduction %	Savings in Rs. Cr. / Yr.
1	Testing cost	80%	6.5
2	Rework/Retest cost	60%	3.0
3	Warranty Servicing cost	70%	4.6
4	Warranty cost	50%	8.1
5	Data capture/recording cost	50%	0.8
6	Data Analytics cost	50%	0.8
		TOTAL	23.8

Several other cost factors have not been considered – e.g. scrap, interest cost, lost sales, inventory holding, vendor evaluation, product innovations, process improvements etc. and which are likely to bring further benefits



Intangibles



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Intangible Gains



Quality Data

Timely and accurate data collection



Customer Delight

Use data to devise ways to personalize product/service



Differentiation

Competitive differentiation through innovation



Novel Business Models

Deliver more value and create new revenue streams

In Closing...

- Time for **Industry 4.0 and IIoT** is here and now
- **Huge investments** are being committed
- There is a need to understand **where to place your bets on**
- Start with what **MEASURES** you want to improve and where
- Obtain clear understanding about the **ROI**
- Don't ignore the **intangibles**

Q&A

Thank You

Profit from your connected machines!



*- Imagine and you shall
discover*

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