2022

STERISON TECHNOLOGY PVT. LTD.

Sterison Collaborative Data-Driven Model for Industry 4.0 Transformation

INDUSTRY 4.0

SMART FACTORY
IMPROVE AUTOMATION, EFFICIENCY AND MORE

Smart Manufacturing's focus in the plant is on getting information from the supply chain, such as production forecast, as well as having full traceability of operations. However, plants also must be able to attract a modern workforce capable of deploying the latest Smart Manufacturing technologies, and provide these technologies to its workers.

The data from sensors and machines are communicated to the Cloud by IoT connectivity solutions deployed at the factory level.
These data are analyzed and combined with contextual information and then shared with authorized stakeholders.
IoT technology, leveraging both wired and wireless connectivity, enables this flow of data and provides the ability to monitor and manage processes remotely and change production plans quickly, in real-time when needed.

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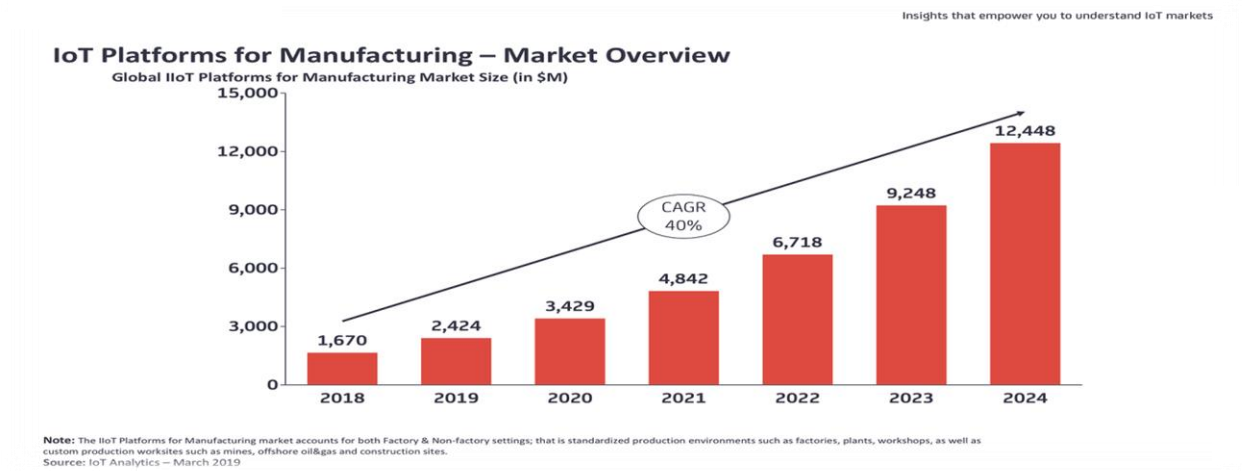
What Does the Future of IIoT Look Like?

IIoT is one of the most exciting technology trends in the world today, but many companies are still in the early stages of adoption.

The future of IIoT will see more connected devices, tighter security, and a falling cost of adoption. IIoT is expected to grow at a CAGR of **16.7%** between 2022 and 2027 to hit **$263.4** billion.

As more device manufacturers and software solutions enter the market, adoption costs will fall. However, as many companies realize double-digit productivity improvements, the perception of cost and benefit could quickly shift as companies seek a competitive edge.



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Facing Challenges in Manufacturing Sector

- Product Quality.
- Unplanned Downtime.
- Production Efficiency.
- Machine performance.
- Maximizing asset utilization.
- Assets lifecycle.
- Production visibility.
- Transparent Supply Chain.
- Maintenance Issues.

Manufacturer challenges

Manufacturers encounter a variety of internal obstacles in addition to the uncertainty of national and international economic conditions. Here are some common problems in manufacturing industry and how to solve them.

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All Intelligent Manufacturing Ecosystem

Co-creation with partners for Domain Industrial Intelligent Applications

CNC & Metal Process | Food & Beverage | Pulp & Paper | Chemical & Pharmaceutical | Electronics assembly | Wearing Apparel | Footwear | Textiles | Furniture | Machinery | Electrical Machinery | apparatus | Measuring Equipment

Advanced Ecosystem applications | Right solution to best fit end customers | Accelerates digital transformation

Smart Manufacturing

SM

- Overall equipment efficiency
- Overall Health & Safety
- Event & Alert Notification
- Business reports

Productivity Optimization Suite

POS

- Shop floor Management
- Assets
- Data connector

Energy Sustainability

ES

- Energy KPI Data
- Energy Products
- Energy Managment

Machinery Operation & Maintenance

MOM

- Predective Maintanace
- Repair Maintanace
- Periodic Diagnostic

Smart Vision

SV

- Product quality vision inspection
- Live data on smart TV
- Birthday/ Event presentaiton
- Customized live display
- Schedule and configuration

Supply Chain Visibility

SCV

- Real-time status updates on jobs .
- improve customer service and cost
- Improved Productivity

Employee Tracking System

ETS

- Helps track human movement in real time
- Makes a worker more productive
- Work place safer

Breakdown Domain Needs, Accumulate Domain Know-How

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Smart Manufacturing suite

Smart manufacturing allows factory managers to automatically collect and analyze data to make better-informed decisions and optimize production.

The data from sensors and machines are communicated to the Cloud by IoT connectivity solutions deployed at the factory level.
These data are analyzed and combined with contextual information and then shared with authorized stakeholders.

It dramatically improves manufacturing outcomes

- Reducing waste
- Speeding production
- Improving yield
- Quality of goods produced

Smart Manufacturing helps to analysis

Overall equipment efficiency
Overall Health & Safety
Provides Event & Alert Notification
Provides various Business reports

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Business Specific KPIs

Configurability of Target programs for each vertical related functioning as KPIs (Key Performance Indicators) for monitoring the Cost-Effectiveness.

- ✓ Net Production
- ✓ Net Efficiency
- ✓ Production Breakages
- ✓ Gross Production
- ✓ Product Goods No. of Pallet Produced
- ✓ Gross Syrup Usage
- ✓ Gross Water Usage
- ✓ Gross CO2 Usage
- ✓ Empty Cans No. of Pallet used
- ✓ Line SKU Rating
- ✓ Quality (Brix)
- ✓ Quality (CO2)
- ✓ Utilization Hourly
- ✓ Downtime Event
- ✓ Utilization Running
- ✓ Actual Speed
- ✓ Lost time due to Speed Reduction (%)
- ✓ Runtime
- ✓ Downtime
- ✓ Scheduled Downtime (SDI/SDO)
- ✓ Gross CO2 Usage
- ✓ Stoppages Count
- ✓ Empty Cans No. of Pallet used
- ✓ OEE
- ✓ Target Production
- ✓ Electricity Usage
- ✓ Product Intake
- ✓ SKU Change Event

50+

Additional Reports

Suits any Industry

can be measured at various ranges or time levels like Hourly, weekly etc.

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Productivity Optimization Suite

IIoT increases productivity, efficiency, decision-making, reduce the cost and enable an organization with real-time information and operational benefits.

Some of the benefits are

- ✓ Reduces The Downtime Of Machines
- ✓ Easy Tracking And Monitoring Of Goods
- ✓ Provides Condition-Based Alerts
- ✓ Minimizes Human Errors

4.0

Risk identification

82% of the companies have experienced unplanned downtime over the past three years and that has Cost Company as much as $260,000 an hour.

Industrial IoT a Way To The Future

Manufacturing process automation will have the largest revenue growth of $47 billion, but manufacturing facilities management will grow fastest (22% CAGR)

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Energy Sustainability suite

Energy monitoring system is the most significant demands to decrease the energy expenditure from the businesses. Smart energy monitoring system technique tracks the usage of energy of different regions of the plant throughout round-the-clock.

The energy Monitoring System is accomplished through the use of Energy meters, along with data loggers. Multiple energy meters is closely linked to an RS485 network. Data logger is utilized to get these data from Energy meters via RS485 protocol.

Finally, these electrical energy consumption associated data is processed and reflected within data logger then data logger transfer this data to the LAN or Cloud server. Authorized person can access the data. The data played an essential part to comprehend the behavior of energy consumption and also to rectify the undesirable energy use in the business

Monitor Real Time Data	Energy Benchmarking	Effective Operation & Maintenance	Energy Accounting	Energy Saving Measurement	Automatic Reports & Alerts
IOT Based Energy Monitoring System monitor the Real Power and other Energy Parameters.	Benchmark the slandered power consumption of your Equipment's and notice when there is any variation for slandered power consumption.	Know the issue in real time and take corrective action immediately.	Know your energy bill before given by Discom and get the breakup of energy share of different equipment's.	Measure the exact Energy Saving achieved by each new project implemented.	Smart Energy Monitoring System get the Performance Reports of your Plant and Equipment's daily, weekly or monthly.

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Machinery Operation & Maintenance

Support for multiple Paths

Execution State
Controller Mode
Emergency Stop
Feed Override

Rotary Velocity Override

Spindle Cutting
Spindle Rotating

Feedrate (Programmed)

Feedrate (Actual)
Part Count
Path Position
Tool Number

Linear Axis Position

Linear Axis Load

Rotary Axis Velocity

Rotary Axis Load

PMC Diagnostic Parameters

Program Name

Subprogram Name

Program Name

visualize data points

Preventive and In-Time maintenance for equipment's in Manufacturing verticals and setting up Sensors for early defect detection basis predictive analytics using various learning and precision programs will help in reducing equipment malfunction and hence downtime.

Machines can also effectively self-monitor, throughout the factory floor and on every line, and flag operators when there is an impending problem, like a component failure.

With wireless monitors connected to easy to use software, the data is collected, analyzed and translated in terms that provide fast and simple results that can be actioned on an ongoing basis. Some monitors are designed to connect easily with all machine types, including Precision CNC, SWISS, Stamping, and Die or Mold.

The data collected includes

- ✓ The condition of the machine (including status and faults)
- ✓ Production levels
- ✓ Current work order status
- ✓ Quality results
- ✓ Downtime data (whether automated or as indicated by an operator)

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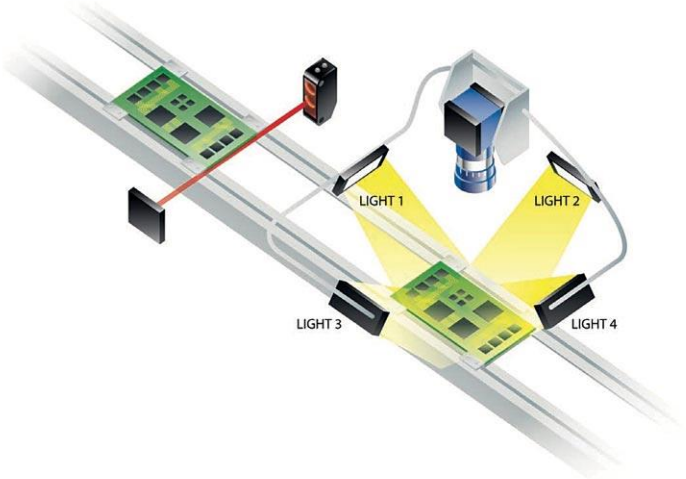
Smart Vision

At Sterison, we have outlined our vision of a fully automated and integrated smart factory that will help you to master these challenges and guarantee your sustainable competitive edge.



Product Quality Inspection

Advanced applications such as vision-based product quality inspection are making their way into the manufacturing space as part of Industry 4.0. The IoT devices utilized for this are cameras and mobile phones, sometimes mounted onto a collaborative robot arm, monitoring the final product for quality test and defect detection.

Smart TV applications

Our industry experts are competent in extending android apps for android TV as well. An IoT ecosystem consists of web-enabled smart TV app which displays the KPI information of factory automation as well corporate related promo information. The schedule and the data can be managed in to the smart factory management system.

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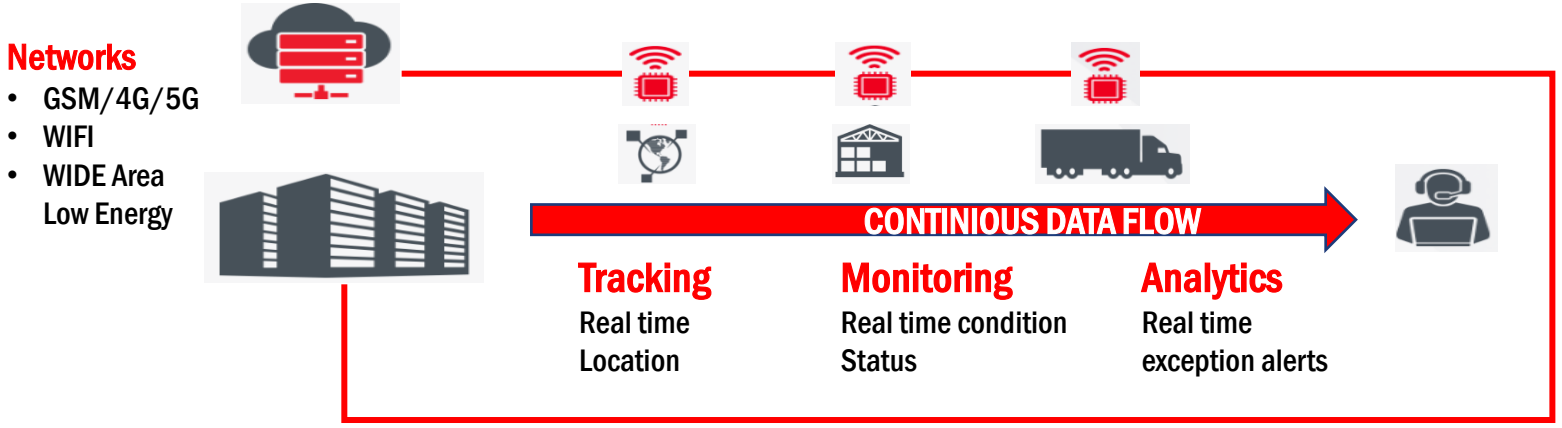
Supply Chain Visibility



How IoT Changes Supply Chain

Real-time location-tracking

Storage environment monitoring

Predict the transportation and the arrival of the product.

01

Higher speed

IoT reduces the feedback circle, allowing for faster decision-making, delay risks mitigation, and improved efficiency of locating goods within the warehouse.

02

Improved flexibility

IoT systems work faster and are easily accessible rather than on premise ones. A supply chain manager ensures that all parties involved in the process have access to specific data by implementing a cloud-based IoT platform.

03

Higher accuracy

Solutions based on the IoT architecture give managers in-depth information on the lifecycle of the goods, helping retailers and supply chain managers know the exact product unit quantity to be ordered.

04

Improved segmentation

The technology allows retailers and supply chain managers to segment products according to the target audience.

05

Increased efficiency

IoT expands the capabilities of connected employee-oriented platforms. Such tools like smart glasses help consult warehouse workers seamlessly to ensure they save time while completing a task.

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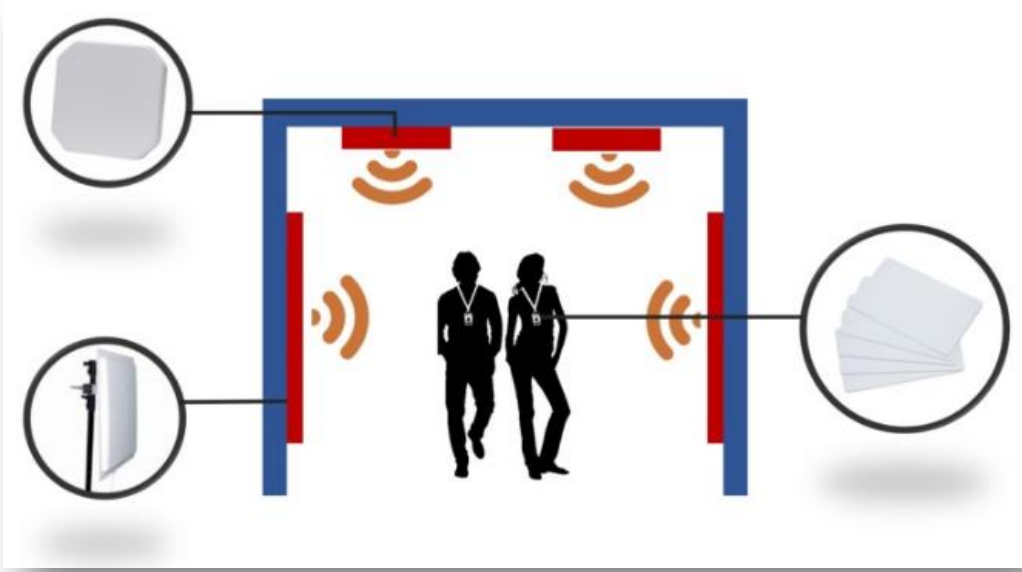
Active RFID Employee Tracking System

Organization can manage employee productivity with ease. By using RFID employee ID cards, you can easily track when your employees start and end their shift, eliminating the need for time clocks. What's more, RFID can be used for employee and asset tracking using solutions like automated locker systems. These help track when and where equipment is being used.

RFID enables you to take the guesswork out of tracking. We customize solutions to the needs of your business and environment, building from these technological components:

1. RFID Tags– These tags may be embedded in employee ID badges.
2. RFID Readers – Readers are mounted at exits and designated mustering locations.
3. Software – This organized the data, allowing you to see where your employees are located.



The solution can be used if

- ✓ You would like to count the number of visitors entering or leaving
- ✓ Require an alarm to be sent for unauthorized entry
- ✓ Track the location of personnel using choke points placed at the entry and exit points of buildings

Promote Safety

Pinpoint the exact location of personnel to ensure immediate response during emergencies.

Provide Security

Assign access to zones in your facility only to personnel with the appropriate security level.

Ensure Accountability

Log personnel time & attendance activity to ensure employee productivity.

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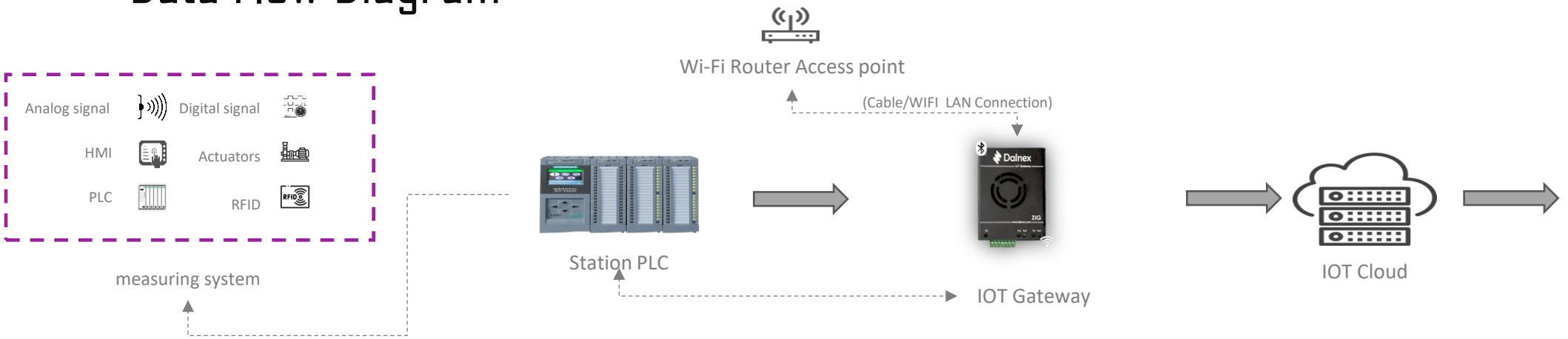
Data Flow Diagram



Machine specific data can be read over rs232/rs485 port to connect with IoT device and the data can be captured periodically . The same can be send to cloud as batch operation.
IOT device can have the capability to connected with modbus TCP/profinet/ profibus/RS232 communication protocols

Station PLC will enable the provision to connect all new sensors or the sensors from existing environment.

Based on different registry value the data can be exposed for the communication protocol.

IoT device will be connected all signals over the GPIO pins or RJ45 and from the communication port with all the signals are converted in to data to full fill the business requirements. Device have the Sqlite DB which store all data locally and send periodically to the cloud through background sync process. Event action like downtime notification will be triggered on demand basis.

IOT cloud will make the API publically to communicate all IOT devices, also this is the source point for preparing all master data like products, shift time configuration, etc.. IOT cloud will do the data analysis and prepare the relevant report to be display on portal as well sending email and SMS notification to the respective stakeholders.

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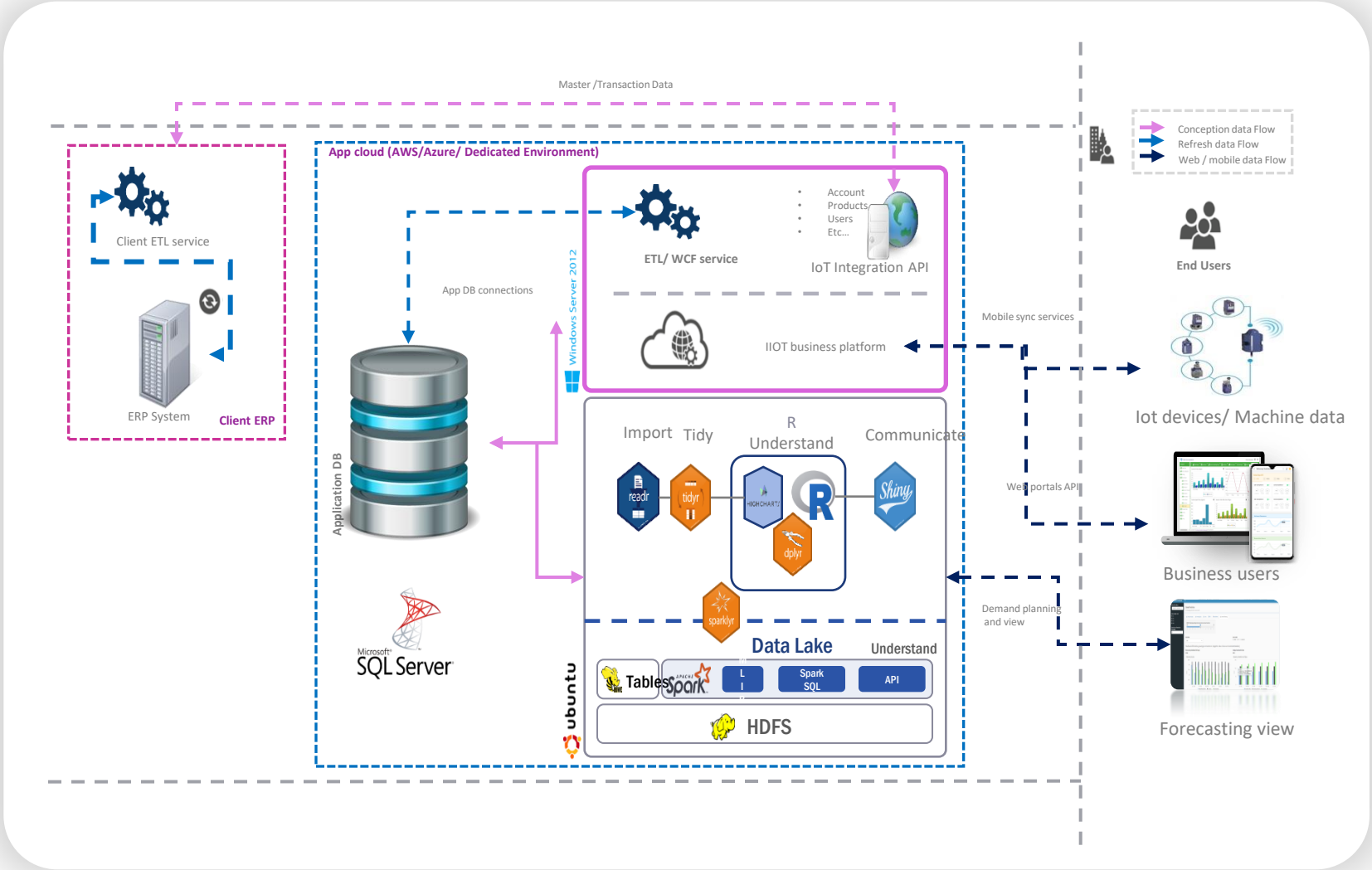
High level solution Architecture

The overall design of the data tier can greatly affect an application's performance and scalability. The cloud storage platform is designed to be massively scalable to meet the data storage and performance needs of modern applications.

IIOT Platform Technology

Angular 8+	.Net MVC	R	Python
Cordova	WCF	R Shiny	Node JS
Xamarin	SSIS	Ext JS	MS SQL
Kivy	Kivy MD	Sqlite	



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Success Case Study

17%
Productivity Increased

25%
Manpower reduced

About Client

Dufil is home to Nigeria's most loved noodle brand, Indomie Instant Noodles. It has established itself as the leader in the instant noodles. The company owns and operates an instant noodles manufacturing plant

Challenges

Dufil was facing issue due to unpredictable downtime as a result they could face lack of productivity.

Solution offered

Our proposed IoT solution provides real-time monitoring of appliances and products. It also optimize and improvise the processes that Dufil carry out through accurate data extraction and converts data into a user readable format for managers to effectively make decisions.

Business Impact

Improved machine performance, production efficiency, process reliability, downtime measurement and more.. As a result, they increased 17% productivity and reduced 25% manpower within one year.

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The Impact of IoT in Manufacturing

47%
Improving Operational Efficiency

31%
Improving Productivity

29%
Creating new business opportunities

28%
Reducing downtime

27%
Maximizing asset utilization

18%
Ability to sell products as a service

18%
Reducing assets lifecycle costs

14%
Enhancing workers safety

13%
Enhancing product innovation process

9%
Better understanding of customer demand

Source: Morgan Stanley-Automation World Industrial Automation Survey, Alpha wise

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Our Commitment

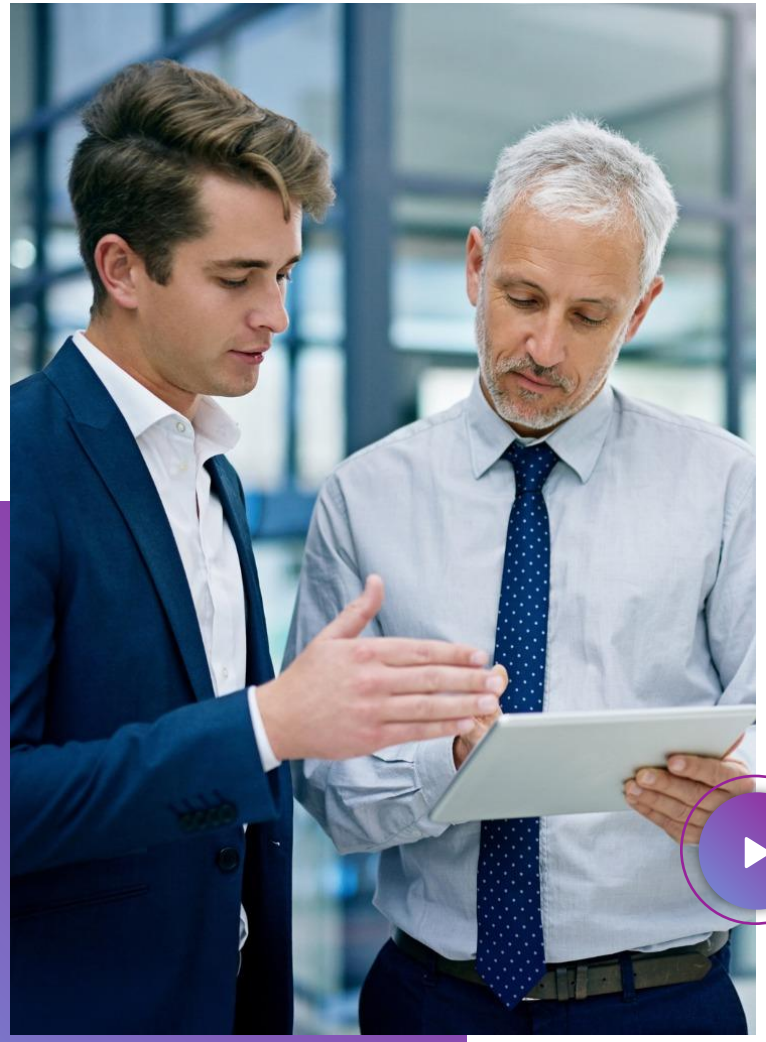
At Experian, we are only driven by customer success, providing a great experience during the partnership phase. To be able to achieve that, implementation planning for effective organizational transition is paramount. Outcome is all that matters. Our experience delivering products for the global market has given us the insight to be driven by pre and post implementation metrics to predictably deliver outcomes for our customers.

There is also significant planning that goes into phased roll-out in a large organization coupled with gamification to motivate people to adopt faster than their peer groups. Bottom-line for us is - system delivery alone is not the end, but the route traversed is equally or more important.

Sterison Vision

providing real time market intelligence helping customers achieve..

- Revenue growth
- Operations efficiency
- Better customer service



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Next steps

The manufacturing industry can study, learn and draw conclusions from what other industries are doing in the digitalization field and analyze how to apply those experiences to its own activities. Communication and relations with other industries will help the cement industry to learn, either through lectures, conferences, similar pilot schemes or via informal exchanges.

Assessment	Concept	Implementation	Services
Awareness • Management review	Develop a strategy and process	Obtain digital process	Maintain a culture of awareness
Transparency • Data transparency review	Develop data gathering concept	Implementing digital management system	Extract data through managed services
Efficiency • Technical digitalization	Develop and implement concept	Implement technical optimization measures	Maintain for savings endurance

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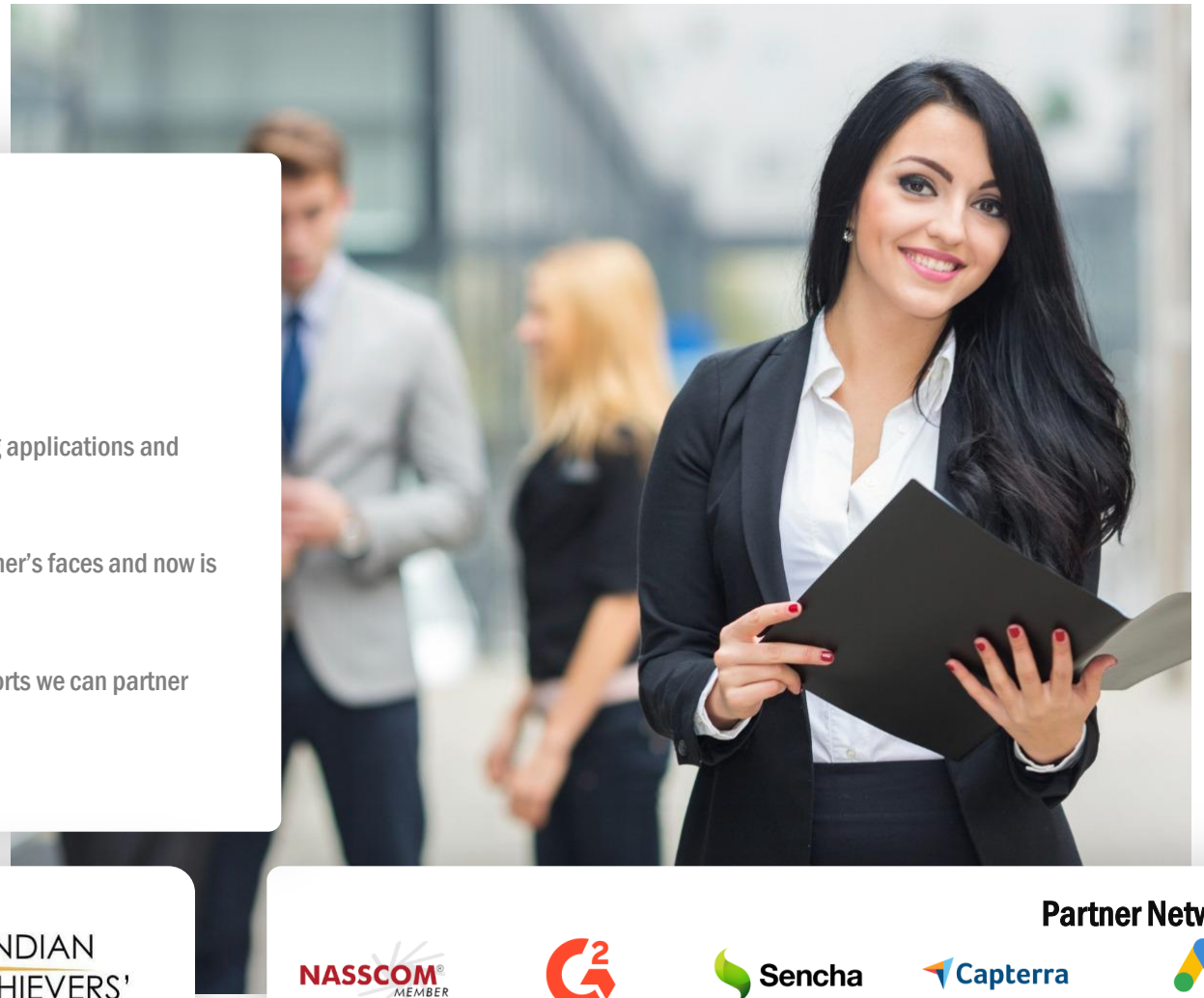
About Sterison

- Sterison is a technology services company with a strong focus on delivering applications and products using multitude of software technologies and hardware products.
- The company has been working tirelessly to maintain a smile on our customer's faces and now is offering a line-up of ground breaking technology products and services.
- Whether you're looking for digitalization service, business solutions, supports we can partner with you at every stage of the business growth!



Our Key Customers

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As machines become more intelligent, this technology can have a positive impact on the everyday lives of citizens.

THANKYOU

Corporate Office
HMP Tower, Market Road, Thuckalay, Tamilnadu, India.

www.sterison.com info@sterison.com +91 7868843405