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A Frost & Sullivan White Paper in Partnership with Schneider Electric

# Realising the Promise of Data

## Breaking down silos for agile and optimised operations

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# Summary

Data has become a strategic asset in industrial environments, and future success depends on how such data is utilised. However, as the volume of data continues to grow at exponential rates, driven primarily by enhanced connectivity and the proliferation of mobile and Internet of Things (IoT) devices, it often ends up in siloed, departmental, or use case-specific systems, unorganised data lakes or data swamps.

The challenge with collating data from different silos is that it takes time and as a result, it reduces the agility of the enterprise.

A harmonised apps environment – such as that enabled by Schneider Electric's ***EcoStruxure Plant Advisor*** – can help enterprises process, aggregate, contextualise and analyse data in real-time and link such insight to meaningful KPIs and outcomes. And this – when leveraged effectively – can translate into higher revenue, lower operational costs, increased production yield and throughput, reduction in unplanned downtime, extension of asset life, improved product quality, and higher customer satisfaction.

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# The Disconnect in Data and Application Silos

***Digital transformation*** and the convergence of information technology (IT) and operational technology (OT) has disrupted virtually every industry – from consumer packaged goods (CPG) to minerals, metals and mining (MMM), to chemicals, to water. However, despite digital transformation gathering pace across industries (making data the lifeblood of industry 4.0[1] organisations), ***data silos*** (data that is not easily shareable across systems and departments) remain a key challenge across industrial environments. In addition, devices from disparate manufacturers make accessing and analysing data generated a formidable challenge.

Approximately 51% of business leaders surveyed by Frost & Sullivan claimed that ***investigating and utilising data is a top business priority***.[2] However, whilst the Industrial Internet-of-Things ***(IIoT)*** has presented organisations with smarter and more effective ways of measuring and monitoring operational performance, advances in sensors,[3] mobile solutions, cloud computing and connectivity have also resulted in a ***massive surge in the volume of data being generated***.

Data in itself does not add value unless it is ***integrated and contextualised***. This is where data silos present a major stumbling block.

### *The IoT Boom*

IoT device unit shipments will reach **66.8 billion** globally by 2026

(up from 24.4 billion in 2019); registering a compound annual growth rate for 2019-26 of 15.5%

Over that same period, IoT device unit shipments for factory and industrial automation applications will grow much faster

**(22.8%** compound annual growth rate for 2019-26)

*2020 Update--Global Internet of Things (IoT) Devices Forecast, 2017-2026, Frost & Sullivan, Jul 2020*

1. Seen as the fourth industrial revolution, Industry 4.0 is enabling smart factories by configuring cyber-physical (Internet-connected) systems coupled with artificial intelligence (AI) to leverage IIoT for seamless machine-to-machine communication, data transfer, and advanced automation of processes throughout the value chain.
2. Growth Opportunities in the Global Edge Analytics Market, Forecast to 2025, Frost & Sullivan, Oct 2020
3. Sensors are now miniaturised, more robust, wireless-enabled, low-powered and lower priced

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*The Challenge with Data and Application Silos*

| Cause of Data and App Silos | Consequences of Data App Silos | Organisational Impacts |
|---|---|---|
| • Inadequate skills and capabilities in-house | • Lack of an accurate, integrated and consistent view of operations | • Compromised worker effectiveness and empowerment |
| • Multiple apps and data sources with varied access and governance issues | • Disjointed and interrupted workflows on account of disparate apps | • Loss of revenue |
| • Ad hoc and department-specific implementations at different points in time, to keep pace with organisation growth | • Lack of real-time insight | • Erosion of customer base |
| • Installation of systems with limited integration capabilities | • Excessive time required to track relevant information impacting productivity | • Compromised competitiveness |
| • Absence of organisation- wide collaboration protocols and practices | • Slower decision-making | • Weakened employee morale |
| | • Lack of transparency and trust across the organisation | • Negative impact on asset lifecycle |
| | • Higher costs in maintaining disparate, duplicate and redundant systems | • Negative impact on sustainability performance |

*Source: Schneider Electric*

A global survey of manufacturers revealed that the most mentioned challenge hampering the effective leverage of data in plants and networks was insufficient skills and capabilities.[4] The survey also highlighted the fact that 80% of manufacturers feel that data-driven insights and analytics can increase productivity. [5]

With data-driven organisations constantly unlocking ***new value and improved business outcomes*** through the leverage of IIoT, the trend toward ***widening the pool of applications*** is gathering momentum. However, while the proliferation of highly specialised applications helps tackle a wide variety of operational challenges and extends capabilities, it also creates a very ***fragmented app ecosystem***. Deriving value from such a data architecture patchwork is a huge task, made all the more difficult by the more urgent business and operational priorities that take precedence within organisations.

4. Data Excellence: Transforming manufacturing and supply systems, World Economic Forum, White Paper, Jan 2021
5. Ibid

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A site manager may want to compare his plant with others in the organisation to optimise his own operations. A regional leader may be in need of the 'big picture' view to benchmark across countries and regions. The recall manager may want to know where every pallet is at a given point in time across sites. The maintenance manager may require better data transparency around maintenance procedures and outcomes across assets. All of these scenarios may be complicated even further in the case of organisations that have grown via acquisitions of widely differing entities with different systems across regions. Whatever the operational need, data silos make it time-consuming, cost-intensive and extremely difficult to achieve accurate, centralised and real-time visibility.

In some instances, this challenge is addressed by organisations investing heavily in building fully-customised integration solutions from the ground up. This is a time- and cost-intensive approach and may lack the scalability required to address future needs.

In most instances, however, organisations do not seek to go down the purpose-built route. Instead, they would much rather focus on their core business and leverage an ***open and scalable solution from a trusted partner*** to enable them to draw the right data from the ecosystem of solutions they use and apply that insight to ***optimise people, processes and assets***. Time to implementation is also reduced and the solution is scalable across different equipment, sites and domains, converging data silos and applications.

## EcoStruxure Plant Advisor

One approach to help to scale domain expertise and address the challenge of data and application silos is to leverage a solution such as Schneider Electric's ***EcoStruxure Plant Advisor***. A scalable, open, pre-packaged or tailored IIoT solution (within the EcoStruxure architecture), EcoStruxure Plant Advisor helps manage, analyse and contextualise IT and OT data from multiple systems and sites, providing real-time, industry-specific or domain-specific data analytics.

It does this by allowing access and collection of operational data, from edge to cloud, within one standard industrial data model and contextualising data in a common framework. It takes away the need to devote extensive IT resources toward customised solution development and reduces time to implementation through its plug and play customisation features. Providing a choice of custom or pre-packaged applications, EcoStruxure Plant Advisor can address industry-specific needs, be it CPG, other discrete manufacturing, MMM, water, etc. It delivers the benefit of scalability by allowing the expansion of apps to all equipment and sites.

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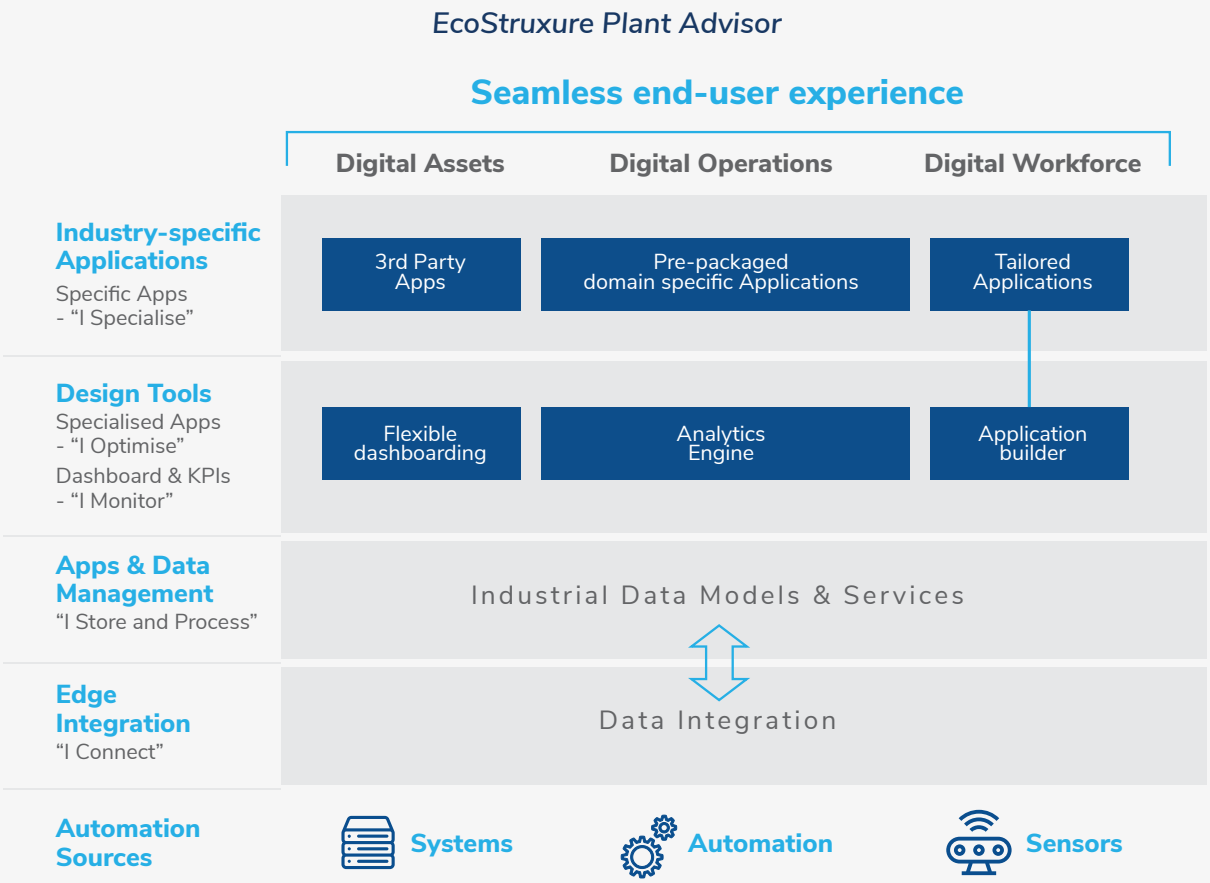


*Source: Schneider Electric*

With ***EcoStruxure Plant Data Expert***, users can collect and forward a diverse range of IT/OT data (from edge to the cloud) using a standardised data model that facilitates adding or changing data by equipment, process and store data, and monitor data exchanges to support rapid diagnosis. By 2030, 70% of all industrial data will be processed at the edge.[6] As a result, edge integration and the ability to process data at the edge will become even more crucial.

***EcoStruxure Plant Advisor – Live View*** facilitates search for data and the rapid creation of tailored dashboards that can help in identifying blind spots, with access to favourite charts and real-time alerts highlighting changing conditions.

***EcoStruxure Plant Advisor – Apps Builder*** is a visual "drag & drop" application development environment that allows users and software developers to quickly build industrial IoT business applications to match the needs of their business using a low-code/ no-code approach. It empowers industrial businesses to get the right insights they need to simplify operations and improve efficiency. The workforce across different departments receives key information in the form they most need to leverage their full potential; thus improving worker productivity and effectiveness.

6 Digital Industrial and Energy Guidebook, Frost & Sullivan, Jan 2021

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***EcoStruxure Traceability Advisor*** comes in a modular approach to address the needs of end-to-end traceability and transparency in the CPG industry. The solution comprises modules for track & trace, product information management (PIM) and food safety end-to-end outcomes. For example, for track and trace, use cases include anti-counterfeiting, digital tax verification, supply chain optimisation, events tracking and inventory management. Leveraging EcoStruxure Traceability Advisor - PIM enables creating a single source of truth for product data, with increased data accuracy and availability (compliant with GS1 and Global Data Synchronisation Network (GDSN) standards), as well as reduction in labour costs and time to market. Finally, the end-to-end module enables a wide range of use cases, such as enabling time and cost savings in recalling products in the supply chain; thus ensuring the right control and visibility of the end-to-end journey of each item manufactured.

## The Traceability Use Case

### *Challenges across the Food & Beverage Supply Chain*

- 600 million – almost 1 in 10 people in the world – fall ill after eating contaminated food and 420,000 die every year
- Average direct cost of a recall for food companies ~US$10 million (excluding brand damage and lost sales)
- US$110 billion is lost each year from unsafe food in low- and middle-income countries
- Unbundling of production creates supply chains that span across countries
- Increasing number of food recalls (for example, in the US, rising from 82 recalls in 2012 to 124 in 2019)
- Sustainability imperatives increasingly requiring visibility around emissions, energy, water, waste, etc. through the supply chain

*WHO, USDA, Food Marketing Institute and Grocery Manufacturers Association*

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With the globalisation of supply chains and the use of increasingly complex distribution channels, traceability is becoming a key challenge in food & beverage businesses. This is more so because of stricter regulation around product recalls and higher customer expectations around transparency and source of origin. To ensure farm-to-fork traceability and transparency, food & beverage processors have to leverage a range of standalone apps, including origin and ingredient specific data applications, MES,[7] SCADA[8] and related manufacturing process applications, track and trace modules for supply chain and product information PIM modules. The technology tools to track and trace are in themselves so diverse; ranging across barcode, GPS,[9] RFID[10] /RLTS[11], biometrics, infrared, as well as other sensors, timers, and automators.[12]

With EcoStruxure Traceability Advisor, food & beverage processors can centralise product and production information and cross correlate across apps through a unique user interface to obtain a full end-to-end view. Data accuracy and consistency across different internal and external sources of information can be achieved to address supply chain optimisation or recall management efficacy objectives or build the electronic passport of the finished good.

## Leveraging EcoStruxure Plant Advisor

Frost & Sullivan's latest best practice research[13] suggests that general purpose algorithms, applications and analytics provide low returns for industrial customers. As a result, these customers are turning to domain-specific solutions. Recognising this need, Schneider Electric provides through EcoStruxure Plant Advisor industry-specific software and apps (catering to sectors such as CPG, discrete manufacturing, MMM, water, chemicals, etc.)

In addition, the scalable and modular nature of EcoStruxure Plant Advisor means that solutions can be accessed based on the level of the customer's maturity and stage of digital transformation.

Applying EcoStruxure Plant Advisor to its own network of smart factories globally, Schneider Electric is able to compare the most relevant performance KPIs across sites and regions, so that plant and operations managers can collaborate and optimise the performance of its supply chain.

Apart from such demonstrable evidence of EcoStruxure Plant Advisor's ability to create actionable insights within Schneider Electric's own organisation, there are compelling success stories of leveraging the platform across a range of external customers and industries.

7. Manufacturing Execution Systems
8. Supervisory control and data acquisition
9. Global Positioning System
10. Radio-frequency identification
11. Real-Time Location System
12. Internet of Things and Traceability for Food & Beverage Manufacturing Market, Forecast to 2025, Frost & Sullivan, Sep 2018
13. Digital Industrial and Energy Guidebook, Frost & Sullivan, Jan 2021

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*Water Sector Process Optimisation leveraging EcoStruxure Plant Advisor*

*Source: Schneider Electric*

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*MMM Sector Process Optimisation leveraging EcoStruxure Plant Advisor*

*Source: Schneider Electric*

## Critical Success Factors

Whilst a ***lack of budget*** is one of those hard-to-ignore barriers to implementation of enabling solutions such as EcoStruxure Plant Advisor, it is often symptomatic of a more significant problem – **that** of a ***lack of a clear vision***. Such a vision can be articulated best in the need to move away from making critical decisions within traditional silos to a ***culture of collaboration and connectivity*** among various data islands. Fortunately, today there is increased acknowledgement of the fact that IIoT-driven analytics is one of the most effective ways for enterprises to make better, faster, data-driven decisions that improve their operational efficiency and profitability. Industries are now focusing on ways to analyse, monitor, predict, contextualise, and visualise processes and asset performance.

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However, a lack of in-depth industry knowledge among third-party IIoT vendors hinders rapid scaling of the digitisation ladder. That is why it is critical that enterprises identify and work with a ***trusted technology partner*** with the combination of competency and understanding of the customer's domain. Schneider Electric's breadth of solutions and services, its network of certified partners, as well as its experience serving diverse industries means that end-to-end support of customers is delivered – from scoping to implementation to maintenance. The company's ISO 27000 cyber security credentials also mean that all modules leveraged are cyber secure.

Another area of uncertainty that can impact long term outcomes is that of the scale and pace of transformation. In this context, an approach of starting with ***proof-of-concept*** project (with a clear and defined scope) will enable immediate demonstration of return of investment (ROI) and successful scale up once the pilot shows results.

A ***continuous improvement approach*** (both in the customer organisation and in the technology partner organisation) can then help explore new use cases, fine tune outcomes and ensure greater impact.

# Conclusions

Whilst new data grows exponentially (on account of the increase in the level of networking and connectivity amongst people and machines/devices), managing the complexity of both historical and new data, making sense of it, and translating it into critical business decisions can be daunting. Unfortunately, less than 5% of plant-level data generated is converted into actionable insights.[14] The complete elimination of disparate data silos – at this stage – may be unrealistic. However, the ability to extract value despite the existence of data silos is accessible.

Industrial enterprises are actively looking for new ways to streamline their operations and increase the productivity and profitability of operations. They now seek to optimise one of their own most valuable assets — data. But converting data into actionable insights is not something that most industrial enterprises have expertise in.

To fulfil the promise of data, a scalable, open, tailored or pre-packaged cloud-based, off-the-shelf IIoT solution such as EcoStruxure Plant Advisor can reduce time-to-value for industrial enterprises by enabling easy and seamless connection with existing data sources (i.e. data-source agnostic). Its easy-to-use, intuitive tools support rapid configurability, flexibility, and scalability. Its breadth of applicability across a range of industries means that specific requirements are addressed from the ground up.

14. Digital Industrial and Energy Guidebook, Frost & Sullivan, Jan 2021

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