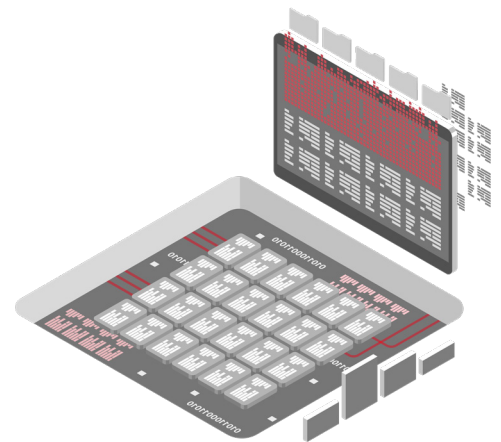


ARCURVE

The OT/IT intersection

How operational technologies can move your business forward

Operational Technologies (OT) are the systems that run physical processes, devices, or infrastructure in a business. OT includes supervisory control and data acquisition (SCADA) and distributed control systems (DCS) such as Citect (Schneider), FTVView (Rockwell), and Ignition (Inductive), which are usually only operational. A data historian, like Aveva PI, Honeywell PHD, or Trihedral VTScada, is then typically employed to capture operational digital history. Historically, OT systems have also operated differently from the rest of the traditional IT department and are typically run by different business units.



As we watch technology advance, Machine Learning opportunities have sped up the intersection of OT and IT. Cloud vendors and many OT software tools have provided safe and secure ways for businesses to move data to the cloud. This data convergence has added a certain degree of complexity to the data value stream, raising data governance questions such as who owns it, where accountabilities should lie and how downstream users of the information then consume it.

The impact of machine learning on the OT/IT gap

Machine Learning on physical assets – like the machinery, tools and sensors used in a production environment – has increased the need to consume the data produced and use it in a practical way to streamline business efforts. Prior to the existence of the cloud and the prevalence of machine learning, OT data was typically reviewed and analysed within the historian program and then select aggregates of the information, such as total volumes sold or processed, were then distributed down the data “food chain”.

As the cost of using the cloud decreases, we see many organizations focusing on moving their OT data into the cloud. This change has democratized the data and has enabled data engineers and data scientists to experiment with the data, develop models, test them, vet them and ultimately retain the models that add business value. Frequently the results of the models are looped back into the SCADA system or a data historian where they are consumed by operations. Alternatively, output from the cloud in the form of a dashboard or report is then also consumable by the operations team. In the same cloud architecture, that data can then be used for business analytics and reporting – ultimately, driving business efficiencies.

Common OT Trends

OT data has become a cornerstone to delivering data products with advanced analytics and machine learning into the market. As technologies advance so does the OT/IT dynamic, particularly as operational opportunities are sought after to move a business forward. We see many of our clients implementing OT to help add to their bottom lines and are dedicating resources and budgets to a corporate historian as well as to import data into the cloud at scale.



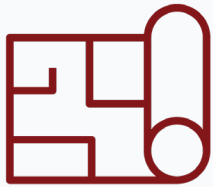
Increased focus on OT strategy

It has become increasingly common to see corporate planning include an emphasis on corporate historians and a data strategy. Leveraging systems such as PI and VTSada as an abstraction layer for all SCADA data has gained popularity. Many organizations end up with multiple SCADA systems through mergers and acquisitions, and changes to these systems are slow, highly disruptive, risky, and expensive. It is much easier to consolidate disparate SCADA systems in a common historian, and subsequently push that data to the cloud.



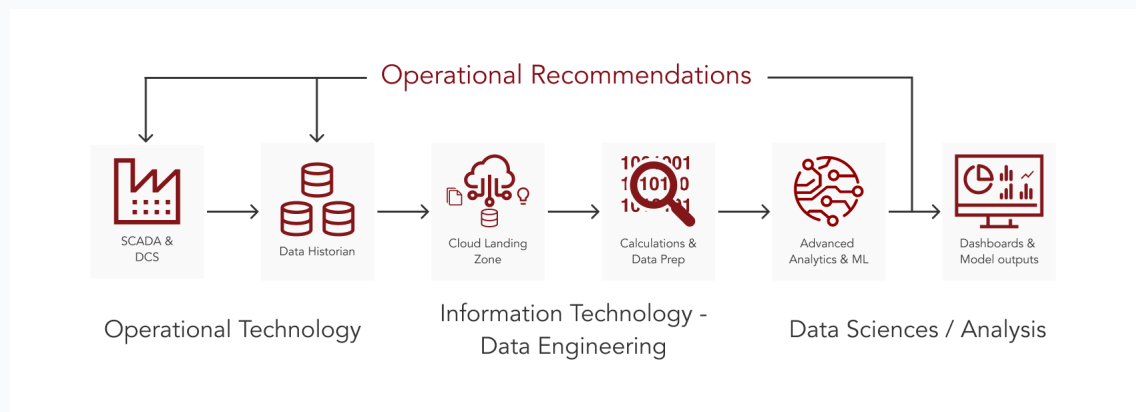
Increased popularity of Lakehouse architecture

The cloud has been commoditizing storage and computing for years, and this has greatly expanded the surface area for advanced analytics. Data lakes have matured into delta lakes, and other tools such as snowflake and Synapse that separate compute and storage costs. This has made it easier and cheaper to bring all data into the cloud, increasing the data exploration surface area for analysts, engineers, and data scientists. Several cloud vendors have popularized the lake house architecture, a better version of the data lake. These paradigms have helped with the intersection of commoditized Databricks has a comprehensive read on the lake house.



The need for cloud data guardrails

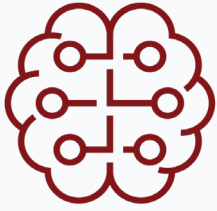
Data lineage is a challenging problem in every data environment. In the case of OT data, it has a lineage that can look like the following:



Guardrails are a strategic set of best practices to help decide where accountability and functionality exist in the data value chain. Every step in this data value chain may have different stakeholders who need bespoke calculations and alerts. This presents a barrier to democratizing data. For example, if a calculation has been applied in the data historian, does the data scientist have visibility into how that calculation was constructed? Does the calculation belong in the SCADA system, in the data historian, or in the cloud?

Often, fixes are made in the cloud infrastructure to facilitate analytics or machine learning but are not propagated into the system where they belong.

The other side to this challenge is that the guardrails become too stringent, and the heavy hand of corporate governance stifles innovation and progress. Jobs that need to be done go underground into excel ecosystems that are simply not sustainable.



Increased Operational Trust

Not only are operations providing data required for machine learning, they are frequently consuming the outcome. If a data model is making recommendations as to what a business should do, trust needs to be maintained and established. As the return on investment in machine learning continues to grow, operations will increasingly consume cloud data products.



Taking advantage of skill commoditization

With the trend to move OT data into cloud architectures, the capability required in the organization is also greatly simplified. Many businesses will require fewer employees capable of maintaining SCADA or data historians and will instead invest in cloud engineers and data scientists.

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