Cloud-enabled manufacturing

A guide for companies considering adopting cloud solutions to support shop floor operations

Accenture Industry X

accenture

Introduction

Historically, Manufacturing Operations Management (MOM) applications were deployed on-site, requiring local infrastructure and local support services structure. Remote hosting – mainly in on-premise central datacenters – began to accelerate in the last decades but did not become the preferred approach in many cases, mainly due to availability and latency concerns associated with external network links.

In recent years however, network providers have been offering robust solutions that are affordable to most manufacturers, which eliminate (or significantly diminish) the performance and availability concerns from past experience.

On the software side, MOM application providers have been introducing cloud[1] hosted solutions sold as a service (SaaS) that allow manufacturers to implement new capabilities without the requirements of owning them.

Cloud providers have been steadily launching innovative components that bring voice recognition, image processing, advanced analytics, machine learning, geoprocessing, and other disruptive technology platforms (sold as a service – PaaS) into reach of manufacturers in a cost-effective and relatively easy-to-use way. Cloud provider also offer infrastructure services (IaaS) that allow manufacturers to host their applications in state-of-the-art remote datacenters, which can significantly reduce the IT footprint at manufacturing facilities. In addition, the leading cloud vendors have launched innovative products to run workloads on premise, thus enabling hybrid and edge architecture models for companies to integrate their shop-floor, mission-critical and real-time applications with cloud services.

For many manufacturers this introduces a new set of opportunities, in which they can have fast and reliable external network options, benefit from manufacturing IT systems without the hassle of owning licenses or infrastructure, and implement innovative use cases powered by advanced yet affordable technology.

So much has changed in recent years, specially with the popularization of cloud solutions in manufacturing – and so much transformation is in progress – that plant and IT personnel should rethink their MOM architectures and consider:

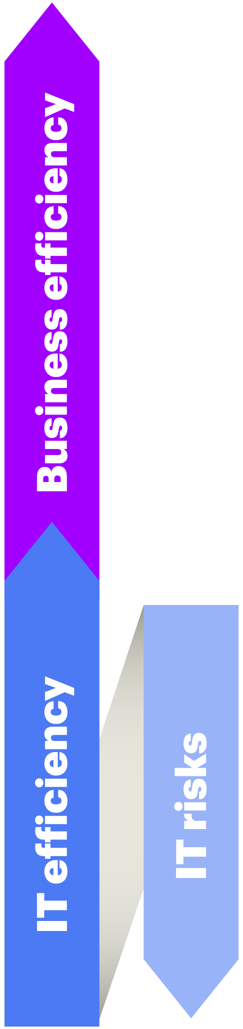
What is the value of cloud in manufacturing?

How to effectively go about implementing it?

In this document we propose a structured way to answer these two questions.

[1] Some organizations use the terms private cloud in reference to their on-premise centralized data centers. In this document, the term cloud refers to public and hybrid cloud services offered by major cloud providers such as Azure, AWS, GCP, Oracle Cloud, IBM Cloud, etc.

Finding the value



Cloud in manufacturing: The three imperatives

Maximize Business Efficiency

The first of the three imperatives addresses increasing a manufacturing businesses' overall efficiency. The idea here is that cloud should not simply provide a new way of provisioning IT resources – but enable better ways to operate.

For example, cloud enables companies to build collaborative supply-chains where they can track or predict order fulfillment and transportation in near real-time. It allows subject matter experts to work across multiple plants without the associated logistic costs and delays. Cloud significantly improves agility to change and enables faster speed-to-value, at scale, by minimizing infrastructure dependencies whenever a solution needs to be deployed to a new site. Furthermore, cloud is the main gateway to manufacturing-relevant software innovations such as Artificial Intelligence, Analytics, Industrial Internet of Things, No-Code/Low-Code platforms, Mobility, Geoprocessing, and many others, which are all components available in cloud providers' marketplaces. By using these services, manufacturers can, for example, use crowd-sourced machine learning algorithms to help explain and predict equipment failure. They can use advanced analytics to share interactive dashboards within and outside the boundaries of their companies' networks, thus breaking data-silos and providing better business experiences to partners and customers. They can leverage components to accelerate hassle free mobility use-cases, etc.

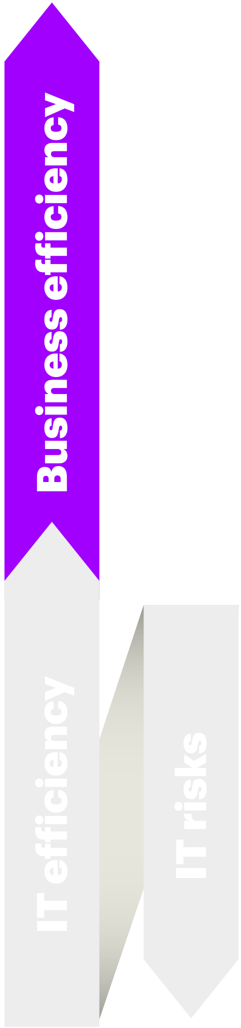
Maximize IT Efficiency

Cloud hosting brings enormous opportunities for IT efficiency. It allows for a reduced IT infrastructure footprint at manufacturing sites, better price-to-performance ratios due to the ability to scale capacity as needed (instead of oversizing on-prem infrastructure), better disaster-recovery capabilities, and automated administration to name a few benefits. For large manufacturers, these capabilities alone are typically enough to justify the cloud adoption business case since they scale up to multiple facilities.

Minimize IT Risks

On the other hand, unlike many other corporate applications, manufacturing systems are usually interconnected with shop floor equipment, which can pose additional challenges to remote hosting due to the introduced failure points represented by external network circuits, as well as their latency. Many of these applications are mission critical to manufacturing, which means that the cost of unplanned outages can be high. In addition, security and data privacy are of great concern as manufacturing data usually reflects a company's intellectual property and in some cases is subject to export control regulations.

So, the question becomes: how to maximize Business and IT efficiencies, whilst mitigating the IT risks?



How to maximize the business efficiency with cloud in manufacturing?

Cloud is more than a virtual data center. It provides access to software components that can enable companies to be more agile by having better visibility and control over their manufacturing and supply chain operations. In this section we explore some examples of such software components.

Analytics
SaaS products like Microsoft Power BI, AWS QuickSight, Tableau, Qlik, and others enable end-users to create interactive dashboards that include sophisticated visuals, as well as artificial intelligence and mobile support, with relatively little configuration effort.

These solutions, combined with other cloud-based capabilities such as identity federation, allow manufacturers to securely share data across multiple companies, improving collaboration and enabling distributed operations – all without the need for complex cross-company interfaces.

What is more, commercial models such as pay-per-session significantly reduce the initial costs as companies will only pay if the dashboards are used.

Artificial Intelligence (AI)
Manufacturing can greatly benefit from machine learning, image processing, and other AI tools offered by cloud providers to augment human decision making. Typical examples are predictive maintenance to minimize unplanned asset downtime, generative design to improve product development, machine vision to perform quality inspection faster and better than humans can do, etc.

For example, a Global Oil & Gas company is using cloud to train machine learning models to notify engineers about abnormal asset operations in their oil fields. Without a tool like this, the engineers would have to spend days analyzing operational data of thousands of pieces of equipment to identify possible abnormalities[2]. A semiconductors manufacturer is using test results and manufacturing process data such as setpoints and

[2] Such tools could be developed without any cloud component, but it would cost much more. Cloud has simplified the data collection in the company's remote locations, the data processing via ML components, the training of these ML tools via temporary provisioning of compute and storage capacity, the visualization via map services, the collaboration with local maintenance teams via video-conferencing, etc. This company achieved all this with minimum investment in infrastructure.

measured variables to identify correlation between operating conditions and product quality. Another example that is relatively common in the chemicals industry is the use of neural networks to identify symbols, tags, connections, and tables in scanned engineering drawings such as P&IDs, in order to create electronic versions that are easier to use and to maintain. The benefits of AI can also be seen in the controls layer in multiple industries where general purposes learning frameworks are used to take sensor inputs and produce setpoint recommendations to optimize non-linear and complex processes.

Industrial Internet of Things (IIOT)

The combination of cloud, public networks, and the advent of industry standard protocols has enabled manufacturers to use field devices data in ways that were not previously possible.

As an example, manufacturers can now buy wireless vibration and temperature sensors from online retail stores, install them in less than one hour, and receive alerts on their cellphones when critical pieces of equipment begin to indicate early signs of failure.

Other examples are platforms such as PTC ThingWorx, Inductive Ignition IIOT, Azure IOT Hub, and AWS IOT that enable manufacturers to connect to plant-floor devices and use their data in pre-built, cloud-hosted[3], easy-to-change applications that can be quickly modified according to the plant needs. These platforms are well suited for near real-time monitoring of remote equipment (e.g. water stations, wells, etc.), logistics monitoring (e.g. truck and rail car tracking), telemetry, and for integration of smart sensors, valves, switches, and modern field devices for better asset performance monitoring.

[3] Some of these products can be deployed on-premise as well.

Low-code/No-code

With cloud-enabled "LC/NC" development solutions like Mendix, Appian, Outsystems, PowerApps, or Honeycomb, among others, users can create apps to automate manufacturing data collection or workflow execution even if they don't know how to code. This can be of exceptional value for manufacturers which are keen to harness IIoT and software capabilities, but do not have available software developers on staff.

MES Lite

For some industries, like tier-2 and tier-3 suppliers in automotive, basic track-and-trace requirements are fairly standard and can be addressed by cloud-hosted "MES Lite" solutions such as AVEVA Insights, 42Q, and Ez-MES. These SaaS solutions can be implemented relatively quickly and are often robust enough to meet many OEM's compliance standards, effectively enabling suppliers to enter into contracts without having to build expensive IT capabilities first.

Note: While some MES vendors are betting on cloud-native solutions that can address basic use cases of multiple industries, most of the mainstream MES providers still focus on traditional architectures in which systems are deployed in bare-metal or in virtual machines hosted on-site, on central datacenters, or in pubic could providers. For the most part, these vendors are investing on other SaaS capabilities that generate value based on data extracted from their traditional MES products, but they are not replacing their MES products with new cloud-native applications.

Other SaaS capabilities

Years ago, manufacturers would have been required to buy infrastructure and licenses, train support teams, and manage periodic patching/upgrading processes in order to adopt tools such as Product Lifecycle Management (PLM), Laboratory Information Management Systems (LIMS), Planning and Scheduling tools, Warehouse Management Systems (WMS), Document Management Systems, Statistical Process Control (SPC) packages, Environment Health and Safety (EH&S) suites, etc.

The cloud has removed some of these barriers. SaaS offerings have enabled manufacturers to provision such tools fairly quickly and use hybrid cloud services to integrate them, no matter where they are hosted.

"Smart" capability build-up

In addition to the ready-to-use solutions listed above, manufacturers can also rely on cloud providers to leverage platform components such as:

- Machine learning algorithms for predictive maintenance and predictive quality.
- Optical character recognition for physical documents data processing.
- Elastic storage and processing power for process modeling, simulation, optimization, and other algorithms that require high performance computing.
- Computer vision for hazard detection (examples, people without personal protective equipment, or people in restricted areas) and for product inspection.
- Natural language processing for speech-to-text applications such as logbooks.
- Temporal databases for time series storage and analytics used for asset condition monitoring (e.g. Industrial Internet of Things).
- Data lakes for manufacturing data democratization.

Case study

Biesse – Generating greater value from machines

An Industrial Internet of Things (IIoT) solution delivered new customer services capabilities for Biesse Group's machinery aftermarket business.

Business Challenges

By implementing connected asset management across its machinery, Biesse Group hoped to improve operational efficiency, reduce costs, and open new revenue streams such as machine usage analysis and production process optimization. It also identified a range of services to help increase performance and productivity to satisfy customer appetite for new digital capabilities.

The Solution

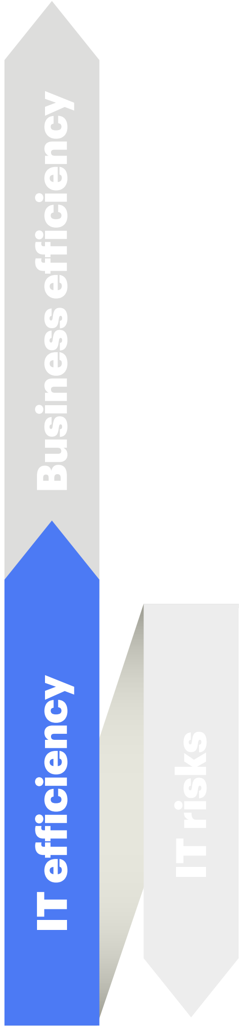
Biesse Group and Accenture designed an IIoT operating model, business case, solution, and roadmap using the Azure platform's flexible architecture and preconfigured technologies. The solution included:

- Preventive maintenance alerts and machine management
- Manufacturing events analysis and remote software distribution
- A pay-per-use model allowing customers to tailor services

Value Delivered

- Expanded value-added services with new revenue streams
- Improved customer service and loyalty
- Reduced warranty and maintenance costs
- Improved product development and customer experience via performance and usage insights
- Increased productivity and minimized outages through predictive maintenance and in-depth analytics

Click here for the full case study.



How to support manufacturing with more efficient IT infrastructure?

Manufacturers are constantly challenged to improve operational margins, and cloud is a significant enabler to achieve that aim.

Technology Infrastructure Cost
Cloud allows companies to shift from underutilized on-premise hardware to flexible pay-by-the-use computing capacity. Based on Accenture research, this can lead to 20%-40% cost reduction if compared to traditional on-site deployment, not inclusive of the additional savings from physical space consolidation and power consumptions reduction.

One aspect of the infrastructure cost reduction that is sometimes overlooked is the availability of non-production environments. At times, development, quality assurance, and training environments are simply non-existent for manufacturing applications as they are expensive in the traditional on-prem model. This exposes the plants to defective software, and what is more, it forces development teams to undertake development, test, and experimentations in production environments.

Technical debt
It is not uncommon in manufacturing facilities to find outdated software and increasingly inefficient (and sometimes vulnerable) legacy infrastructure, which includes aging servers and potentially unreliable firewall appliances. By replacing the IT footprint with cloud infrastructure, manufacturers minimize the local IT maintenance overhead and reduce the risk profile of the operations that depend on this infrastructure.

IT Labor and Operating Cost
Cloud also reduces IT labor and operating costs, as it enables self-service request management and automated service orchestration. In addition, standardized IT architecture and infrastructure lower the number of incidents and the cost of enhancements. Accenture projects have shown that around 20%-30% of the IT labor can potentially be eliminated depending on the size of the organization.

Speed and Flexibility

The traditional approach of locally deploying physical infrastructure at each site increases cost of IT programs as typical server provisioning time in many organizations ranges from 2 to 6 weeks. Cloud can cut this to hours or minutes.

Security and Resilience

Rather than relying on “the plant guys” to maintain the on-site IT infrastructure, and on commercial network equipment which is at times unfit for mission critical purposes, the cloud enables manufacturers to leverage capabilities of leading service providers to keep the infrastructure up and running. In fact, the security level that the mainstream cloud providers such as Azure, AWS, Google, Oracle, and others can build in their datacenters, by far exceeds what would be financially viable to achieve with local resources in most manufacturing plants. Security and resilience are discussed in greater detail in the following section.

Case study

DuPont – Finding a formula for success in Azure Cloud

As a result of a massive Merge & Spin process with Dow Chemicals, DuPont needed to establish its own Manufacturing IT landscape, which included their Laboratory Information Management System (LIMS). DuPont deployed their LIMS in the cloud, which allowed for faster transition, better integration with other systems, and ultimately increased agility at the plants to expedite product release.

Business Goals

- Decrease overall operating costs across the IT landscape
- Adopt an application platform that could meet the scalability, security, and integration requirements (70 plants involved and over 2,000 users impacted)
- Migrate integrated LIMS ecosystem applications within compressed timeline with minimal downtime
- Allow for communications between the two companies across different domains while the data centers and site migrations were in flux

How Accenture Helped

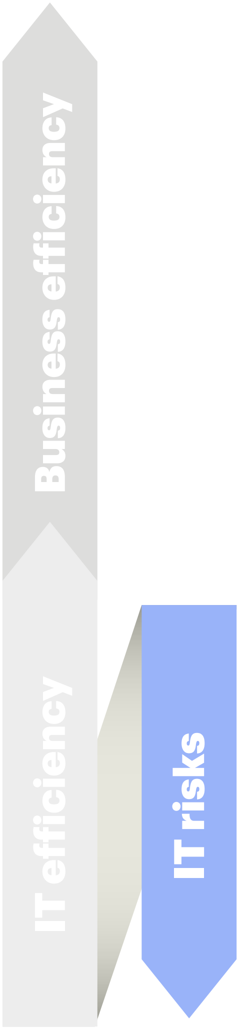
Accenture helped identify and validate the cloud architecture and the migration plan. Then Accenture executed the migration and provided all necessary training and operations support.

Value Delivered

The cloud architecture allowed the migration to happen on time and without disruptions. DuPont has since decommissioned obsolete IT assets and expanded LIMS reach to multiple new sites with no downtime and no new CAPEX commitment.

DuPont consolidated multiple regional servers into one global server to streamline overall application support and management, which has resulted in simplified support organization and IT labor savings.

Click here for the full case study.



How to minimize risks?

Historically, cloud adoption in manufacturing has been a contentious discussion because of security and resilience. However, developments have been made in several aspects of the technology stack, which have turned cloud into one of the safest and most reliable hosting options.

Security
Cloud providers offer multiple services to protect the application and data they store. Examples:

- Directory Services (Azure AD, AWS Directory Service, Google Cloud Identify, etc.) for authentication (e.g. Single Sign On) and authorization support
- Application-defined Firewall to enforce connectivity policies
- Security Reporting (AWS Inspector, Azure Security Center, Google Chronicle) for threat identification and response
- Distributed Denial of Service Prevention (Azure DDoS, Google Cloud Armor, AWS Shield)

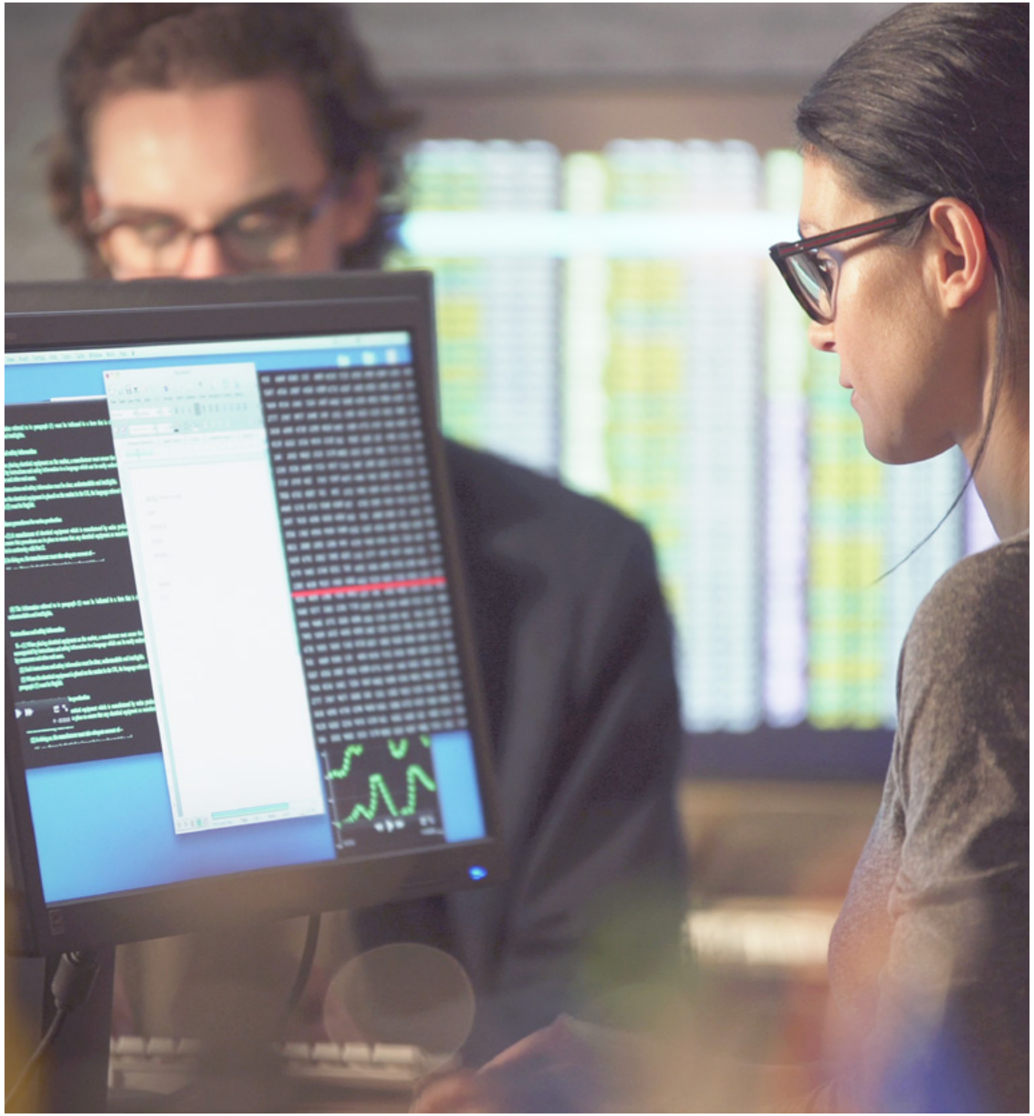
In addition, for manufacturers who prefer to keep data on-premise but still need to use cloud services for their applications – for example machine learning libraries – there are hybrid options such as AWS Outposts, Google Anthos, and Microsoft Azure Stack that allow cloud services, APIs, and tools to become available inside of the manufacturer's very own datacenters.

Security however, is not only about technology; it includes people and processes and requires joint responsibility between cloud providers and tenants. Users need to be trained in best practice, with processes and procedures in place. At a minimum (and this is by no means a comprehensive list), manufacturers need to consider the following dimensions when evaluating security of applications with cloud-hosted components:

- Governance & Risk Management: are there clear rules (policies, procedures, standards, and guidelines) around cloud utilization and cyber defense in place? Are these rules well communicated, enforced, and audited among relevant employees and contractors?
- Hosting Security: is access to all administrative functions restricted to personnel based upon the principle of least privilege and supported through technical controls (e.g. multi-factor authentication, audit trails, IP address filtering, firewalls, etc.)? Are workloads logically segmented (e.g. via virtual private clouds)?

- Application security: are applications and programming interfaces (APIs) designed, developed, deployed, and tested in accordance with leading industry standards (e.g. Secure SDLC)?
- Data privacy and protection: is sensitive data identified and properly taken care of (e.g. encryption of data at rest in storage/database as well as in transit via private WANs, SSL/TLS, Ipsec VPN Gateways, etc.)?
- Digital identity: are user and application keys properly granted/revoked, stored, managed centrally, validated, periodically reviewed, and rightly associated with accountable entities?
- Environments: are production and non-production environments separated, with enforced segregation of duties to prevent unauthorized access (e.g. development personnel accessing production environment)? Is dummy data used in test environment to avoid inadvertently leaking confidential information?
- Device management: are the mobile devices compliant with corporate IT security policies? Are operating systems hardened to provide only necessary ports, protocols, and services to meet business needs? Are there antivirus, file integrity monitoring, and logging tools installed in the devices that interact with the cloud-hosted manufacturing applications?
- Network and endpoint security: are network environments designed and configured to restrict and monitor traffic between trusted and untrusted zones (e.g. perimeter firewalls)?
- Is the organization ready to detect and respond to network-based attacks associated with anomalous ingress or egress traffic patterns?

These dimensions are not exclusive to manufacturing applications. Therefore, most of the organizations that already use cloud providers, already have some sort of cloud security reference architecture in place. Nevertheless, when migrating manufacturing workloads, different types of needs arise, different user communities are identified, different locations, and different use cases, which require special attention.



Resilience

Cloud providers' infrastructure is built for resilience including high availability and disaster recovery. They employ state-of-the-art techniques and equipment that are usually not affordable to average manufacturers.

To take advantage of this, manufacturers need to properly design the solution architectures. Not all applications need the same availability and recovery targets. For example, gas emissions in chemical plants require data to be collected every 10 seconds due to environmental regulations. Typically, this type of data is collected and stored at the edge and sent to continuous emissions monitoring systems via store-and-forward mechanisms. The architecture for this type of workload is different than the architecture for a production accounting system used in seed processing plants, which only operate for a few weeks in a year. Such systems can be down for 40+ weeks without impact but they require very high availability metrics during harvest periods. For this type of application, manufacturers can rely on cloud providers to enable the necessary infrastructure only when it is needed.

A critical risk factor when adopting cloud in manufacturing is the network link between the plants and the cloud provider. Traditional links used in manufacturing facilities typically backhaul all traffic to centralized datacenters where security inspection services can be applied. The delay caused by backhaul impairs application performance resulting in a poor user experience and lost productivity. Manufacturing applications require different networking approach to enable private, fast, and latency-consistent links to cloud providers. Many options for this are available at relatively low cost, which include SD-WAN (Software Defined Wide Area Networks) and private virtual circuits offered by cloud providers (e.g. Azure ExpressRoute and AWS Direct Cloud).

These services are offered by hundreds of telecom providers around the world, which makes them accessible to most manufacturers. Additionally, cloud providers offer services such as AWS Snow and Azure IOT Edge that enable data processing in the field prior to sending consolidated information to the cloud. By using edge services, manufacturers can significantly reduce the amount of data that needs to be sent away from the plants, reducing the need for high-capacity network links.

Another way to secure the low-latency compute is thru 'cloud on prem'. Both AWS (Outpost) and Azure (Stack) have well understood the need for a hybrid architecture and are expanding the services with VMware for applications that are not cloud-native.

Finally, it is important to mention that no matter how well designed an architecture can be, given the relevance of MOM applications to business, manufacturers must be prepared to react if and when failures occur. They need to create contingency processes and have users trained and prepared to execute them when necessary. It is imperative to have backup and replication strategies that are consistent with data recovery business requirements. It is important to test the response plan for common failures and run disaster recovery drills. Cloud services such as AWS Backup, Azure Backup and Azure Site Recovery make these tasks far more simple than they would be in traditional on-prem models.

Moving to action

Define the migration scope

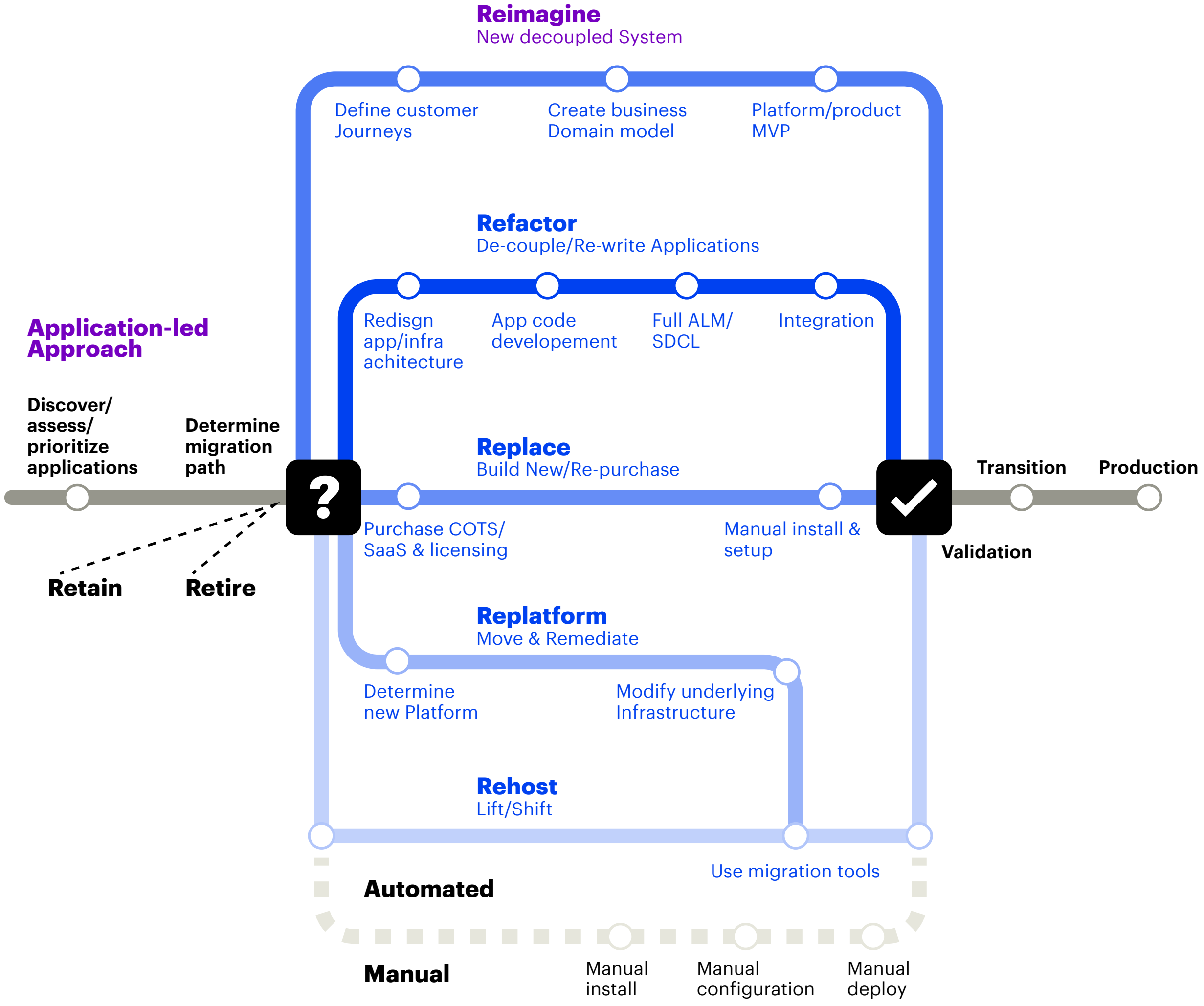
When adopting cloud, companies must evaluate what to do with their existing manufacturing applications. This represents a huge opportunity to eliminate technical debt.

Often there are applications that will likely not represent an attractive ROI if moved to remote data centers or cloud providers (e.g. systems reaching end of life, legacy systems no longer relevant for the business, or mission-critical plant-specific systems that run in remote locations without good network links).

On the other hand, there will be applications that will be more suitable for cloud hosting (be it private or public). For these applications, a comprehensive disposition framework needs to be evaluated to determine the optimum strategy: re-hosting (lift & shift), re-platforming (remediate) or refactoring (decouple/re-implement).

Finally, there will be new business requirements to be addressed. By reimagining the business processes, companies often identify gaps and opportunities that depend on IT solutions not available so far, which will require new systems.

In summary, a comprehensive analysis of the existing assets and business objectives will help map out a future hybrid architecture that leverages cloud/corporate datacenters but also includes on-site components necessary to keep the plant operational in case of external infrastructure failure.



Optimize for drop-and-shop vs. lift-and-shift

Whenever possible, we recommend that instead of simply lifting-and-shifting applications into virtual machines hosted by cloud providers, manufacturers consider first a "drop-and-shop" approach, in which legacy applications are replaced with more efficient systems designed and developed for the cloud and capable of supporting the necessary use-cases. By doing this, manufacturers can leap-frog generations of applications and move to fit-for-purpose and future-proofed solutions.

Avoid the "PoC Petting Zoo"

Given the ease of access to technology provided by cloud, many organizations start by implementing multiple small Proof-of-Concept (PoC) projects. Pursuing these PoCs enable organizations to understand cloud security considerations, create a development pipeline, and take advantage of the technology's elastic principle. However, the ease of experimentation may lead to a disorganized mix of small PoCs (known as the "PoC petting zoo") that never scale or deliver the true value potential.

Common challenges faced by manufacturers that start experimenting with these components include lack of knowledge, underestimating the efforts to turn an idea into a scalable solution, lack of end-user empathy, and lack of funding among others. To avoid these challenges, manufacturers must take a structured approach to govern and fund innovation. This should be part of a broader strategy. Manufacturers are indeed well advised to start simple, but the execution needs to be relentless. Support from the ecosystem of tech providers is advisable to complement any talent gaps.

Define your sourcing model

Our Ascent to Cloud research shows that 84% of companies that are using cloud today have a multi-cloud strategy that includes 5+ cloud providers. By keeping some competitive tension between cloud providers and managing "cloud arbitrage", companies seek to obtain good cost structures to fit their demands. It means that depending on the organization's strategy, once migrated to the cloud, applications might land at AWS, GCP, Azure, Oracle, or other platform as Virtual Machines, Containers, Serverless, or even be replaced by other SaaS options.

Nevertheless, getting the most out of a public cloud provider is about committing to a partnership, and what's more, cloud providers will often be willing to put their own money on the table to kick-start that relationship. This can be a critical boost to digital transformation programs, especially where financing is an issue, helping to smooth the investment curve associated with getting the move to cloud started. Unlike the vendor lock-in scenarios that happened decades ago when software was tied to proprietary hardware and operating systems (e.g. VAX/VMS), exiting a cloud platform today is less cost prohibitive due to the increased portability of cloud applications.

Consider portability needs

Decades ago, applications were deployed on dedicated physical servers. Then, virtualization enabled deploying multiple virtual machines and respective operating systems on single physical servers. Going forward, with cloud, applications will be deployed mostly as containers or as serverless solutions.

Containers work as an abstraction layer between the application and the underlying software components (tools, operating system, libraries, etc.). They allow parts of an application to be deployed as blocks that can run virtually anywhere. They also allow consolidating more applications onto a server compared to VMs by removing the need for the OS and any associated license costs. This translates into more agility and cost efficiency.

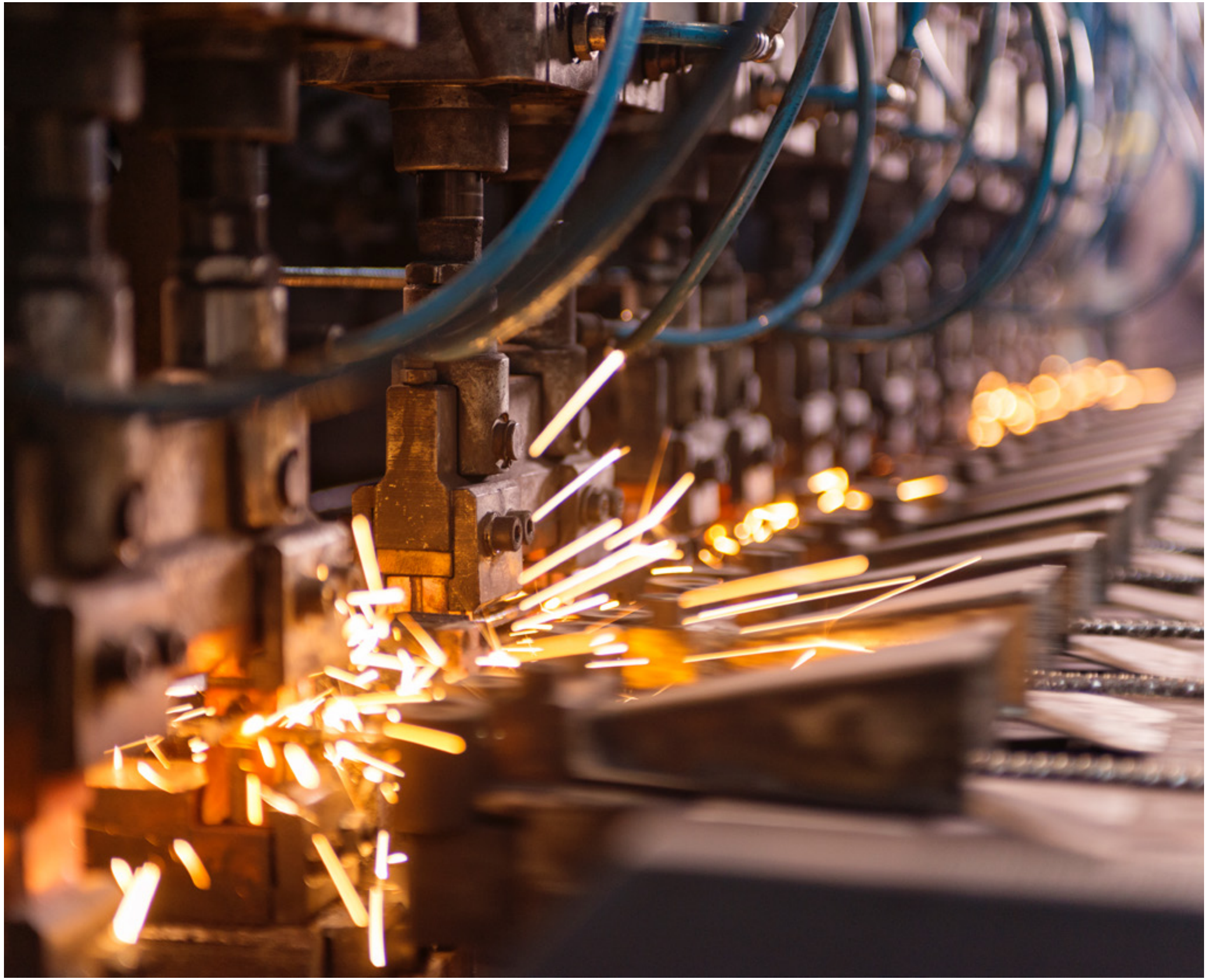
Serverless applications fully leverage native components of the cloud provider to maximize cost efficiency. This approach makes the solution dependent on the cloud provider and porting it over to other cloud providers is typically more expensive than migrating containerized applications.

Moving workloads has a cost. Oftentimes the most cost effective strategy is to migrate the low-hanging-fruits first (re-host and re-platform based on virtual machines and containers) to start generating quick savings that can subsequently be used to fund deeper modifications to specific applications turning them into cloud native or serverless.

Build your operating model

The traditional model of managing capacity by purchasing and running hardware doesn't work in the cloud. Instead, manufacturers must continuously manage consumption and cost. It requires a very different skillset as well as new operational functions.

We recommend that manufacturers adopting cloud establish a cloud Center of Excellence (CoE) that works as a single focal point for both OT and IT. This can significantly accelerate cloud adoption and the associated value realization. The CoE brings central governance and direction to cloud architecture and design choices, helping manage the complexities of distributed and multi-cloud solutions and preventing the confusion that can ensue if individual parts of the manufacturing organization (regions, divisions, departments, plants, etc.) determine to go in differing direction.



So, when to get started?
Now is the time.

We recommend that companies facing abrupt changes in their business conditions consider cloud migration as an accelerator and cost avoidance lever. Examples of such changes include data center exit, mergers, acquisitions, and divestitures, reduction in capital expenditure, end-of-support for mission-critical technologies, regulatory compliance changes, green-field expansion (new sites), among others.

For companies implementing continuous improvement programs (lean, six-sigma, etc.), we recommend that cloud be used as an enabler to scale and sustain the benefits of such initiatives across multiple sites (thus avoiding infrastructure costs and dependencies). Many vendors have made MES-Lite solutions available on-line so that manufacturers can subscribe to have access to OEE, track-and-trace, and some basic reporting capabilities.

Finally, companies embarking on digital transformation should take advantage of cloud as a gateway to access technology required for implementing the new ways of working.

How Accenture can help

We help clients obtain superior returns on their IT investments on cloud projects by providing an evolutionary set of services, from strategy to execution, that minimize uncertainty and improve speed to value. Our cloud-based assessment tools allows us to quickly identify how and where clients can address the three imperatives within their manufacturing operations.

For further discussion or for an evaluation of your cloud adoption plans please get in contact with us.

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