IDC InfoBrief
July 2022

Achieving the Future Enterprise Through Digital Business Acceleration in Asia/Pacific: Manufacturing

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Executive summary

As the world emerges from the COVID-19 pandemic, organizations across the Asia/Pacific region are navigating toward a digital-first world. They are investing in new technologies that enable faster innovation, and building capabilities that deliver greater resiliency, agility, and responsiveness to change. Organizations across the region are increasingly moving workloads to the cloud and while this offers many opportunities to develop new solutions and offerings for customers or improve business processes, it also creates challenges related to cybersecurity.

This IDC InfoBrief identifies the business priorities, challenges, technology adoption, and use case focus areas across multiple industries. It provides thought leadership on designing a digital road map for the future, the need for modern applications, edge computing and the role of multicloud environments.

Digital transformation (DX) in Asia/Pacific seems progressive, with **47% of organizations having an integrated or transformative digital strategy** (i.e., they are 'DX leaders'). However, the reality may be very different, and we expect large variances across geographies and industries — Utilities and Mining companies lag significantly in their digital maturity compared to other industries.

The primary **business priority** for organizations in the region is the creation of new revenue streams from digital offerings or digitally enhanced offerings.

Their primary **technology priority** is the adoption of cloud infrastructure and platforms through an as-a-service model.

IDC conducted a survey of the C-Suite and senior executives across the Asia/Pacific region to understand the primary drivers for the adoption of digital business practices and how they will accelerate organizations into a digital-first future and deliver greater business resilience and agility. IDC analyzed the following:

1,101 organizations

13 markets

(Singapore, China, Hong Kong, South Korea, Australia/New Zealand (ANZ), Vietnam, Philippines, Japan, Taiwan, India, Thailand, Malaysia, and Indonesia)

6 verticals

- Financial services
- Retail
- Utilities
- Healthcare
- Manufacturing
- Mining companies

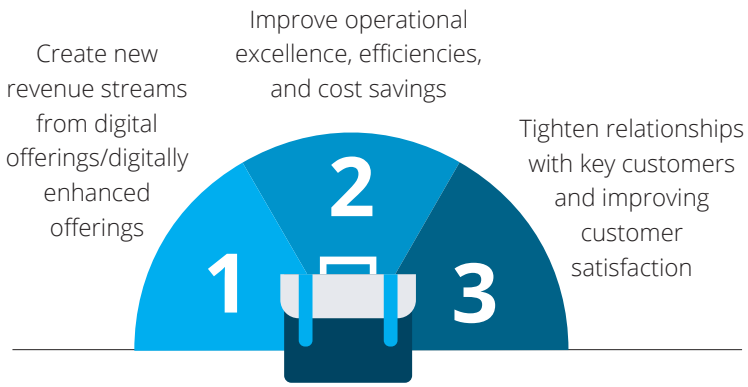
Insights are provided for

- **Advanced economies** (Japan, Korea and Singapore) versus the **emerging economies** (China, India, Vietnam and so on)
- **'DX followers'** (low digital maturity) versus **'DX Leaders'** (organizations that have an integrated or transformative approach to digital technologies)
- **Line-of-business (LOB)** versus **IT** respondents

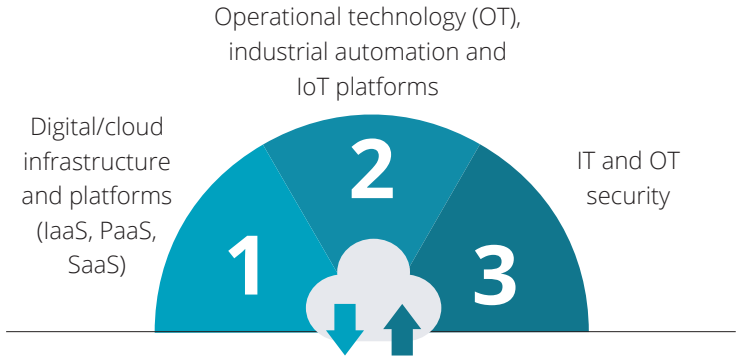
Achieving the future enterprise through digital business acceleration

The creation of new revenue streams from digital offerings is one of the top 3 priorities for organizations in Asia/Pacific. While this is relatively consistent across geographies, advanced economies consider tightening relationships with key customers and improved operational excellence to be slightly more important.

Top 3 business priorities across industries in the region



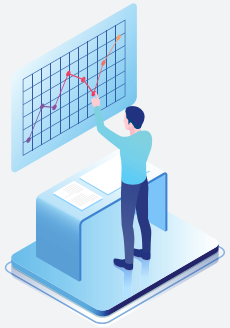
Top 3 technology priorities across industries in the region



Top drivers in the operating environment

- **Nearly 40% of organizations chose efficiency** as the primary driver for improving the operating environment
- **Regionally, 8 out of 13 countries** rated efficiency as a primary driver for improving their operating environment
- **Customer satisfaction, security, and managing costs** all featured strongly; over 30% of organizations rated them as top drivers for improving the operating environment

Advanced versus emerging economies — technology priorities



Variances in responses between advanced and emerging economies are relatively small. However, **advanced economies do place a greater importance on data optimization and big data analytics** — they already curate large volumes of data and are now looking to drive value. **For emerging economies, the survey shows a need for digital/cloud infrastructure and platforms and improved OT using industrial automation (Industry 4.0 technologies) and IoT platforms**.

DX leaders versus followers — business priorities

Again, variances in responses between DX leaders and followers overall are relatively small. However, DX leaders place a **greater importance on tightening customer relationships, improving resiliency, and engaging in new ecosystems**, whereas followers focus on operational efficiency, managing costs, and exploiting new markets.

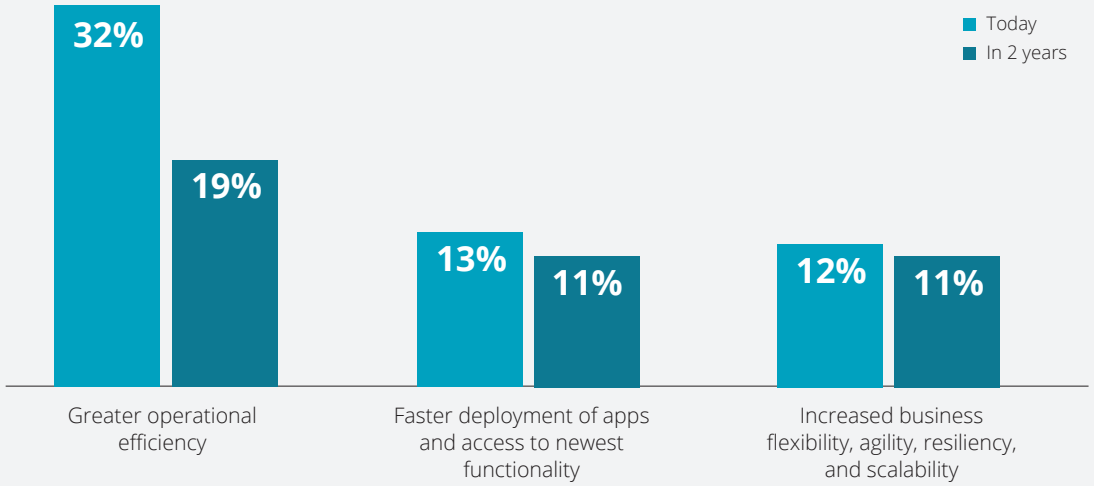
Source: IDC-VMware Industry Thought Leadership Survey, 2022 (n = 1,101)

Cloud technology drives flexibility, scalability, and resiliency

In Asia/Pacific, there is a major shift to the cloud. In the next two years, many organizations plan to place over 50% of apps on the cloud to benefit from greater scalability and better cost management. They believe that the cloud will deliver greater operational efficiency, faster deployment of applications, and increased business flexibility and agility.

Top benefits of cloud technology adoption

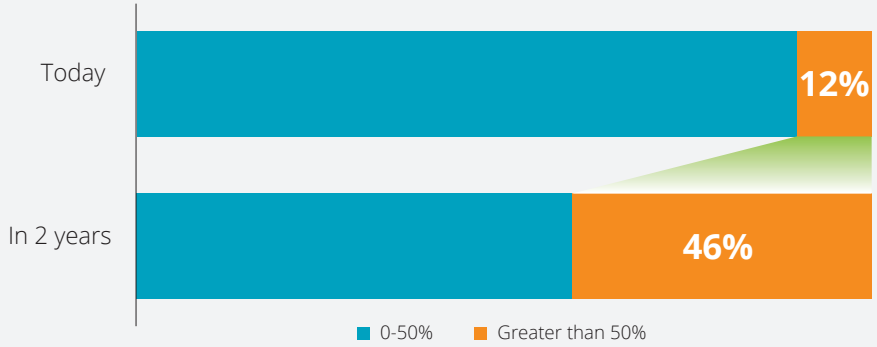
Organizations adopting cloud technology expect improvements in operational performance. Top ranked benefits are:



Although still a top priority, operational efficiency will drop in importance in two years, meaning organizations will shift their priorities elsewhere: the largest increase in percentage for cloud technology adoption in two years is a **reduction in operating costs, increased business unit control, and faster innovation**.

Percentage of new applications deployed to the cloud

As organizations adopt cloud platforms, more of their new applications will be deployed on the cloud. Modern applications designed as cloud-native should be built as part of a modern platform that offers **greater scalability and flexibility, while delivering greater security, better compliance, and better cost management**.



46%

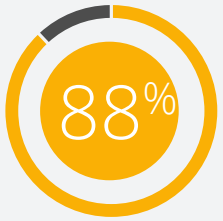
of organizations say they will have more than 50% of net new applications deployed to the cloud two years from now, a huge jump from 12% today.

Source: IDC-VMware Industry Thought Leadership Survey, 2022 (n = 1,101)

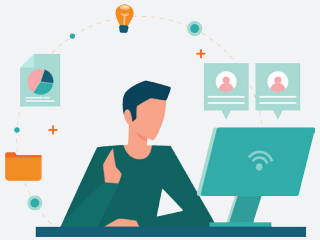
Moving workloads to the edge securely is the next major trend

Most companies in Asia/Pacific plan to deploy edge computing in the next 12 months and 14% have already done so. They will gain a competitive advantage by placing data management and business intelligence workloads, and industry-specific solutions like manufacturing execution systems (MES) on the edge. However, there are challenges such as cybersecurity risks from malware and over-reliance on a single cloud service provider (CSP).

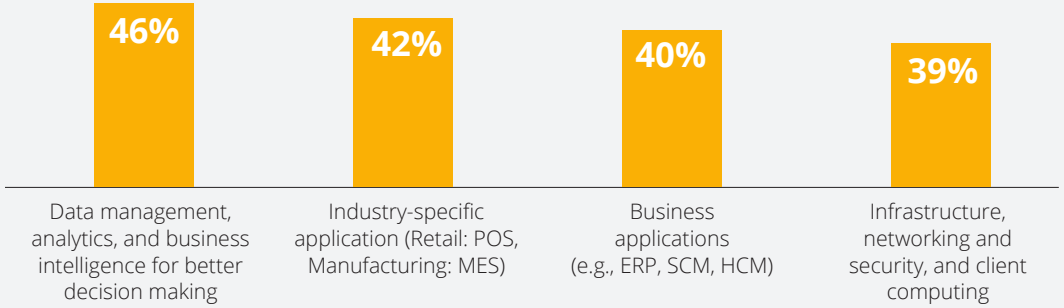
Workloads on the edge



of companies have **currently deployed workloads on the edge or plan to deploy them** within the next 12 months



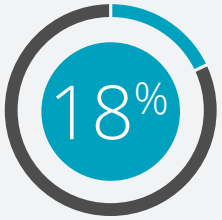
Types of workloads on the edge



Industry highlights:

- Manufacturing: data management, analytics and business intelligence for better decision making — **57% currently deployed or plan to in 12 months**
- Mining: AI life cycle and predictive analytics applications — **48%**
- Retail: Industry-specific solutions like POS — **44%**

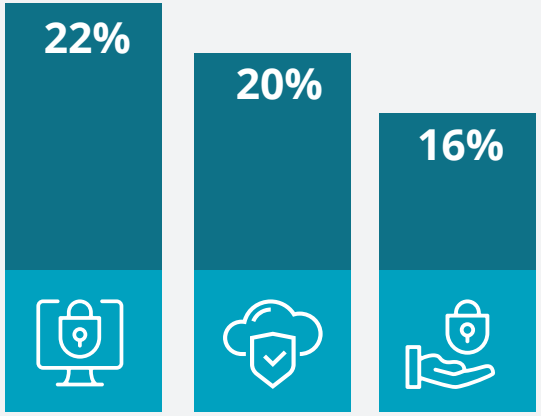
Disaster recovery



of companies do not have a disaster recovery (DR) strategy

33% of companies do not have a DR strategy

Organizations' top 3 security concerns in Asia/Pacific



Source: IDC-VMware Industry Thought Leadership Survey, 2022 (n = 1,101)

Organizations need to overcome various business and IT challenges

Key business challenges in Asia/Pacific when adopting digital/cloud solutions

As hybrid working becomes the norm post pandemic, organizations need to manage a flexible, remote workforce and security and privacy management has become a top business challenge when adopting cloud solutions. Organizations also consider the perceived high cost of adoption to be a key challenge.

Key IT challenges when adopting digital solutions

The survey shows no real standout for IT challenges, which indicates that each organization is fighting their own battles — percentages are very similar across countries but vary somewhat by industry.

Regional/industry highlights:

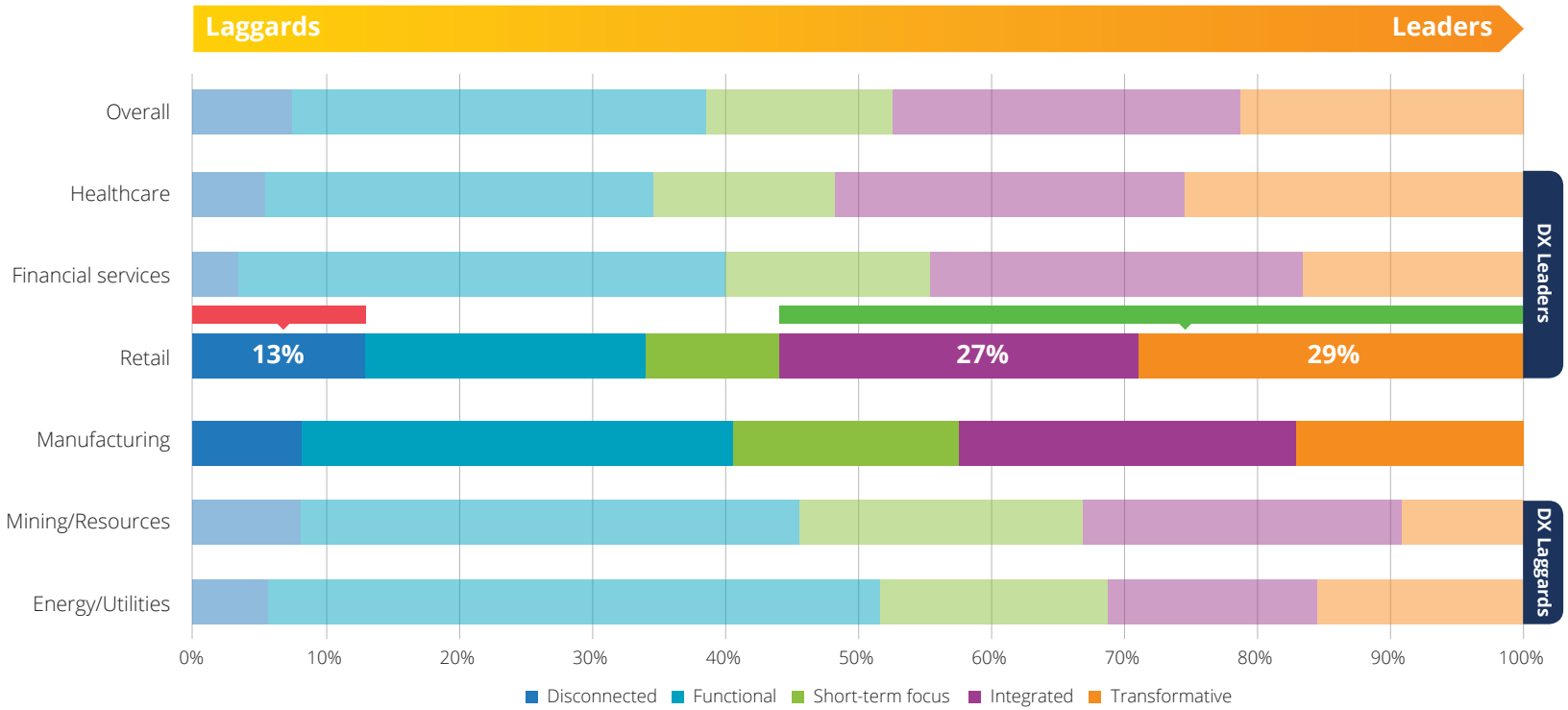
Indonesia: 36% say a lack of technical vision and thought leadership in DX/ICT strategy and road maps is the main challenge

Mining: 32% say legacy technology and infrastructure is the main challenge

DX maturity varies by industry with Retail leading the way

The current status of digital transformation in Asia/Pacific seems progressive, with 47% of organizations classified as DX Leaders. DX Leaders have either **integrated**, continuous enterprise-wide DX innovation programs in place for operations and customer/service experiences or a **transformative** longer-term investment plan in place where their enterprise strategy is to use DX to transform markets and customers by creating new business models and product/service experiences. However, the realities on the ground may be very different and we expect large variances in DX maturity across geographies and industries.

Organizations' DX maturity



Source: IDC-VMware Industry Thought Leadership Survey, 2022 (n = 1,101)

The data shows business to consumer industries are DX leaders — Retail, Financial Services, and Healthcare have a greater DX maturity than other industries. Retail leads with 56% of companies having an integrated and transformative approach to DX.

There is a digital divide, however, as some companies within specific industries embrace DX and others don't, and the gap is widening — those that don't invest in digital run the risk of getting left behind, as seen in Retail where 13% have a disconnected approach to DX.

Utilities and Mining organizations lag significantly compared to other industries, with just 32% and 33% respectively in the DX Leader category.

Essential guidance: building a roadmap for the future enterprise

To deliver digital business acceleration, organizations must understand their current level of digital maturity and build a road map to the future enterprise. Organizations across the region are prioritizing new revenue streams from digital channels, operational excellence, and tightening relationships with customers (delivering better customer support and customer experience). To achieve these goals, they are looking to invest in enterprise cloud infrastructure and automation, while maintaining robust IT and OT security.

Role of technology

Cloud/XaaS Multicloud solutions offer many benefits and are an important stepping stone to building resilient, scalable IT infrastructure. Organizations must examine hybrid and **multicloud platforms** that offer the required functionality **to deliver greater operational efficiency and faster deployment of applications. Adopting as a service solutions, which offer flexibility and scalability, will be a key differentiator.**

Edge Implementing edge computing offers enhanced capabilities for data management and compute power closer to the operating environment and end user. Enterprise infrastructure for edge devices can help to support and deliver **improved performance of various workloads such as business intelligence for better decision making,** business applications, and industry-specific applications.

Disaster recovery **Organizations must implement DR solutions that reduce business risk and improve operations by reducing disruptions** while managing costs effectively due to the flexibility of the cloud.

Industry 4.0 technologies Enterprise cloud infrastructure deployed with secure edge solutions can support a wide variety of use cases across industries. Combined with other **industry 4.0 technologies like IoT sensors and smart devices, digital technologies deliver real-time data, remote operations capabilities, and predictive maintenance of assets**.

Role of implementation

Road map **Organizations must have a clear DX road map that defines high priority use cases and includes the key technological requirements**. The road map is adaptive and offers the opportunity to outline the future of the organization and communicate the vision across the business. Use cases can be mapped across short-term, mid-term, and long-term horizons depending on the maturity of the technology and the organizations' internal capabilities.

Partners **When developing a digital transformation road map, assess and select technology partners who can support you on the journey.** The partner ecosystem from vendors and SIs to hyperscalers can offer valuable insights that will help organizations crystalize their vision. They can be involved in the design and ideation phase of the project, innovation programs, piloting of various solutions as well as in the final implementation.

Stakeholders Organizations must develop their internal capabilities to drive innovation and acceleration. **Senior management must be aligned on the strategy and investment priorities while identifying the key stakeholders, both internal and external**, that will be responsible for executing and managing the project.

Ecosystem If required, **companies can look to the wider ecosystem and find suitable collaboration opportunities with government organizations, educational institutes, and start-ups** to explore innovative new technologies and potential use cases.

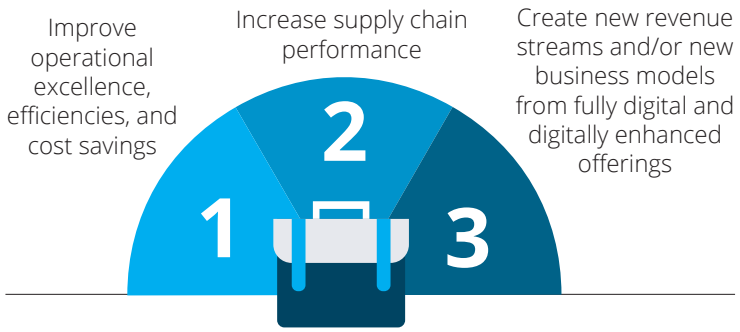
IDC Manufacturing Insights

Manufacturing

Top business and technology priorities in Manufacturing - increasing production efficiency and value chain visibility to address the growing demands of a customer-centric business strategy

The focus for manufacturers is largely around increasing production efficiency and value chain visibility and they are investing in IT/OT cybersecurity measures, adopting multicloud strategies and IoT platform capabilities to improve resiliency, keep a tighter control of costs and improve visibility across their operations

Top 3 business priorities:

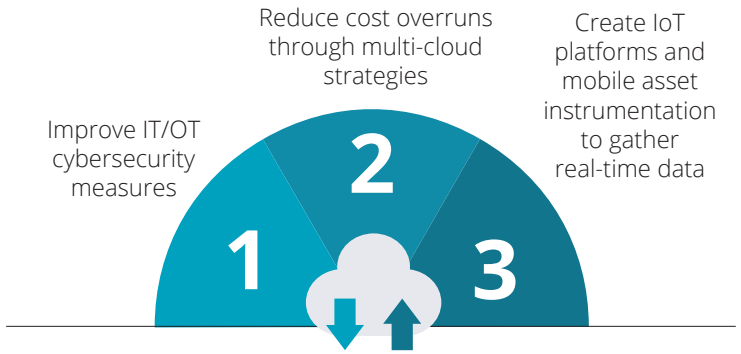


Highlights:

The focus for Manufacturing organizations has been around improving operational excellence, streamlining supply chains, and creating new revenue generation opportunities through after-sales services and digital offerings built on enhanced customer experience and engagement platforms

Several organizations have termed COVID-19 as an inflection point which has resulted in strategies to mitigate operational risks

Top 3 technology priorities - currently:

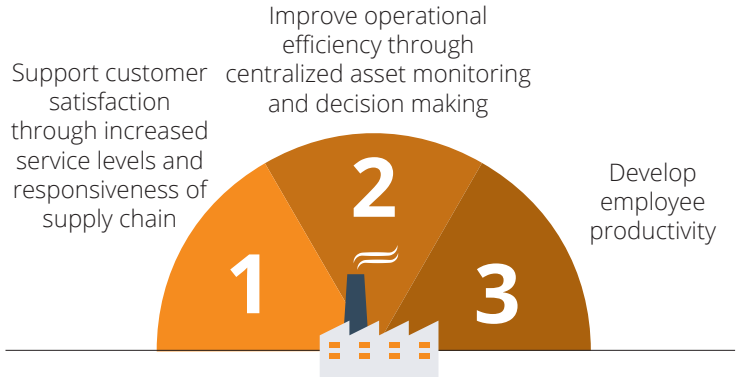


Highlights - current:

IT/OT-related cybersecurity measures have been highlighted as one of the major priorities currently and in the next 2 years, indicating the scale of IoT-enabled devices and processes that are integral to obtaining end-to-end value chain visibility

Reducing cost overruns by investing in multicloud applications and solutions is another key priority for organizations in the region

Top 3 drivers to improve operational performance:



Highlights - two years from now:

To enable a customer-centric business model it is vital to ensure that organizations have good visibility into operational processes and how well their supply chains and operations planning are aligned with market demand

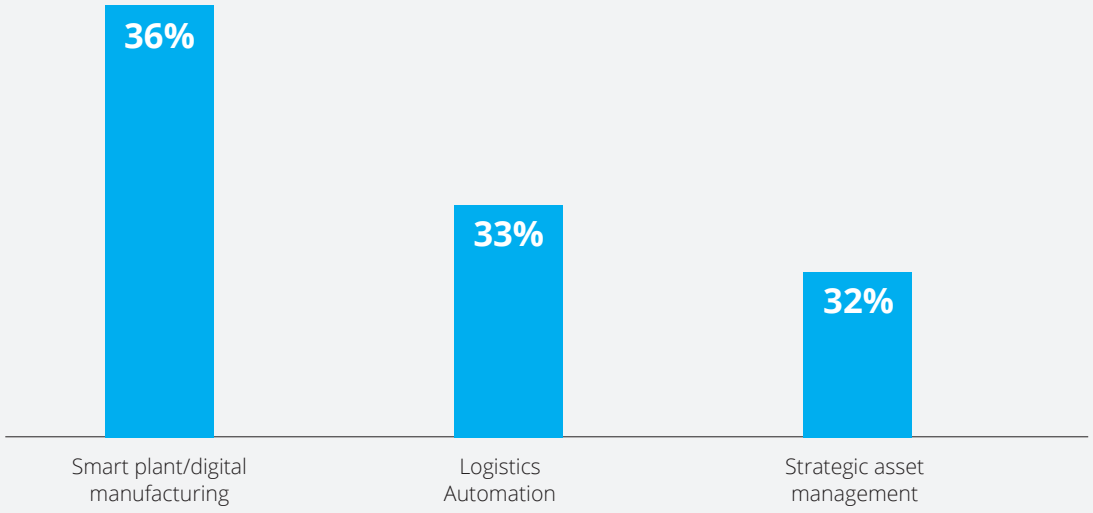
The ability to track asset utilization and performance remotely to increase productivity has been one of the key drivers for Asia/Pacific Industrial organizations

Source: IDC-VMware Industry Thought Leadership Survey, 2022

Top DX priorities and challenges in Manufacturing

In their DX journey, manufacturers are prioritizing digitalized factory and supply chain models, focusing on aligning operational technologies with IT, with an overall strategy to minimize risk across the manufacturing value chain

Top 3 DX programs in Manufacturing

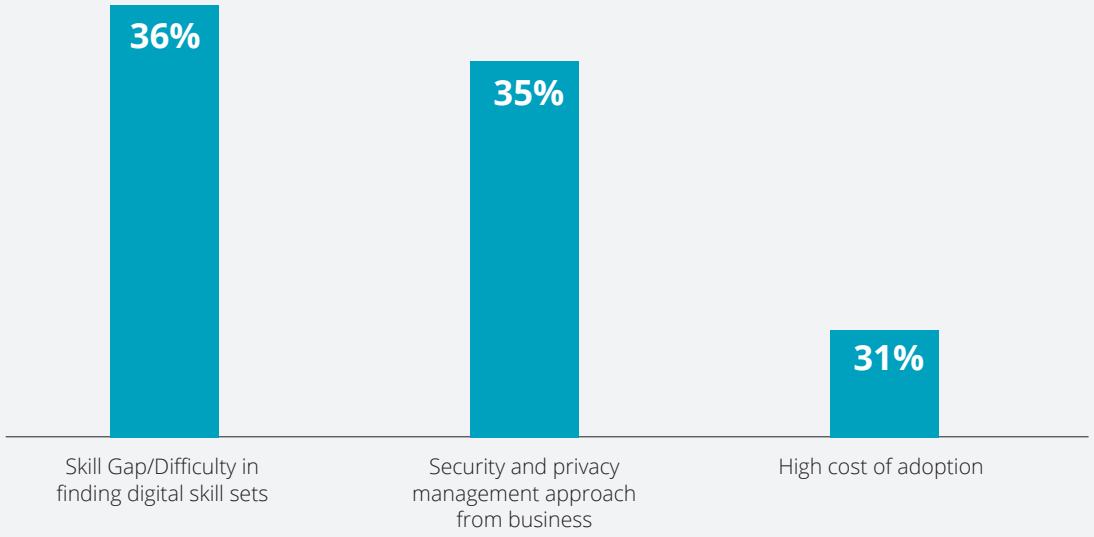


- Smart plant and logistics continue to be a major initiative for most manufacturers with focus on automated business processes
- Supply chain visibility with an ability to track beyond tier 2 supplier levels is another critical DX program for Asia/Pacific manufacturers

58%

of the Manufacturing organizations have either disconnected, siloed, or short-term focused DX initiatives

Key business challenges faced when adopting digital solutions



- Data security, sovereignty along with lack of skilled workforce are some of the key challenges for industrial organizations.
- Understanding where and how data should be stored and handled will result in additional concerns that can limit DX-related initiatives and associated benefits

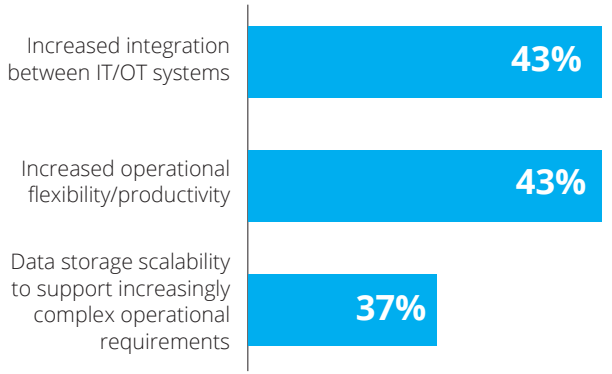
32%

of organizations have highlighted that IT budget justification is a major challenge impacting DX adoption

Source: IDC-VMware Industry Thought Leadership Survey, 2022

Key drivers for change in Manufacturing – building modern apps to drive IT/OT integration, multicloud adoption for greater innovation and flexibility, and edge computing to analyze operational data

App modernization

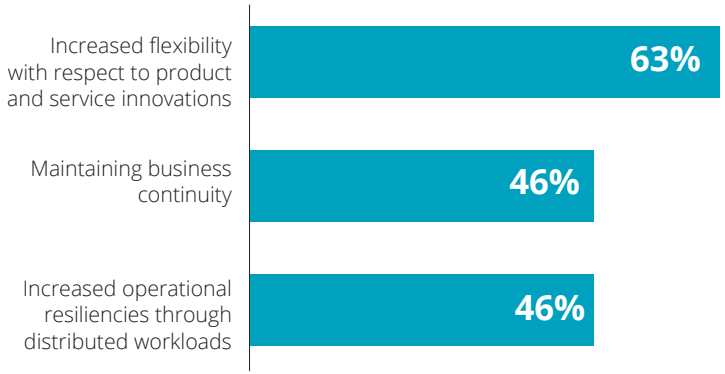


- Allows improved integration between the shopfloor and IT systems ensuring better visibility to market demand
- Enables improved flexibility and productivity in the overall manufacturing value chain
- Increased connectivity also results in the production of asset and process data that needs to be analyzed for optimizing existing processes and identifying new revenue streams.

48%

of organizations in advanced economies are investing in app modernization for increased operational flexibility and productivity

Multicloud

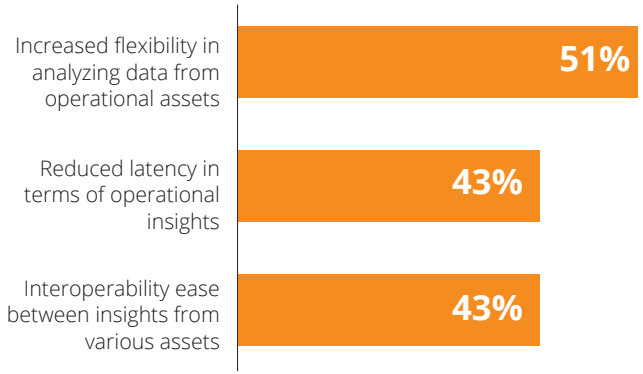


- Increased innovation that stems from embedded flexibility and lack of vendor lock-ins
- Reduces the risk of unscheduled enterprisewide outages and disruptions by relying on multiple cloud platform vendors
- Maintaining business continuity through distributed workloads is also another major advantage that brings in implicit resilience in operational frameworks

63%

of organizations have highlighted increased agility and scalability with respect to product and service innovations as a key advantage of adopting multicloud environments

Edge computing



- A majority of industrial organizations are quite averse to having core and critical data in the cloud, citing reduced transactional data speed and reliability
- Ease of assimilating insights from various assets that are connected locally, and ability to quickly relay instructions to mobile devices/equipment has also been highlighted as a major advantage of edge computing

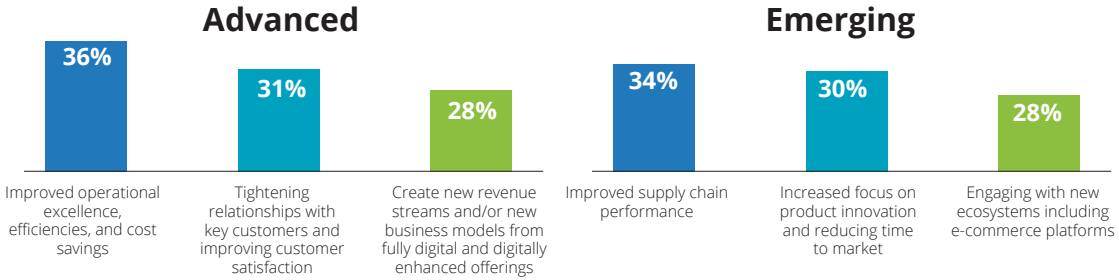
61%

of digital leaders said increased flexibility in analyzing operational asset data as a key advantage of investing in edge computing infrastructure

Source: IDC-VMware Industry Thought Leadership Survey, 2022

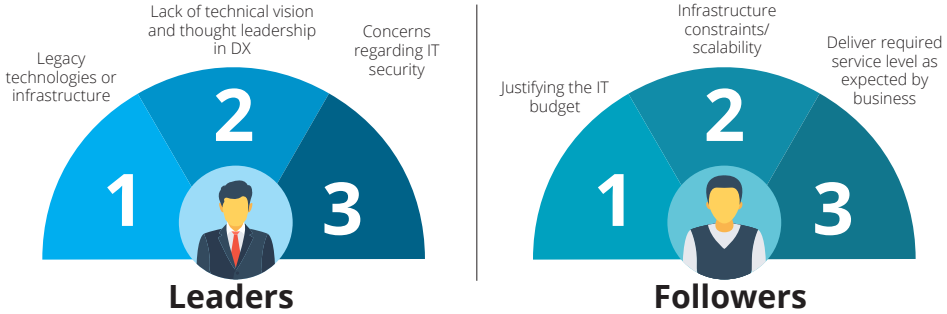
Manufacturing DX leaders are investing in cloud platforms and app modernization to mitigate the IT challenges from legacy technology and infrastructure

Advanced versus emerging (based on top business priorities)



- Advanced economies are focusing on improved operational excellence along with tightening relationships with key customer segments while creating new revenue streams and business models that look to monetize the after-sales value chains
- Emerging economies are looking to improve their supply chain performance while focusing more on product innovation as a key driver for toplines

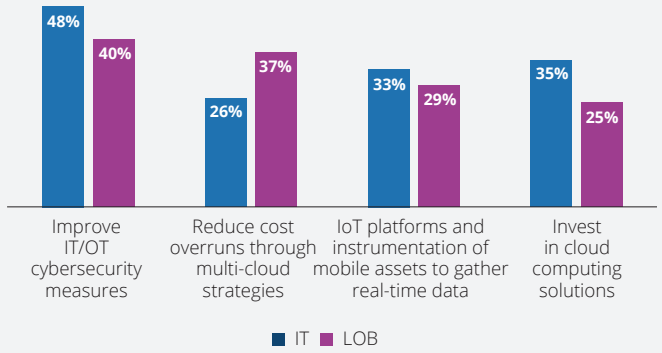
DX followers versus leaders (based on IT challenges)



47% of organizations indicated that their operational performance has been affected by a lack of modernization

- Leaders in industrial sector face challenges because of legacy technologies and infrastructure, lack of vision, and concerns regarding IT security
- Followers are challenged by IT budget justifications, infrastructure constraints, and need to deliver service levels as expected by the business

LOB versus IT (based on top technology priorities)



- **LOBs prioritize IT/OT cybersecurity-related investments** primarily due to the volume of connected operational assets and the inherent risks involved in data management and governance
- Along with IT/OT cybersecurity measures, IT teams are focused on reducing cost overruns through multicloud strategies

Other key Manufacturing insights

- Respondents in emerging economies chose multicloud investment as one of the top 3 technology priorities primarily as a means to manage cost overruns while their peers in **advanced economies focused on enhancing value chain visibility/ecosystem through supply chain visualization, analytics and IoT platforms**
- **30%** of the Manufacturing organizations are looking to deploy between 31% to 50% of net new applications on the cloud, which is about 10 percentage points higher than the current levels of adoption
- One of the key advantages of app modernization for Asia/Pacific manufacturing leaders has been in improved IT/OT integration, delivering better performance and security
- Distributed workloads, through multicloud investments that deliver increased resilience, has also been highlighted as a major benefit

Source: IDC-VMware Industry Thought Leadership Survey, 2022

Manufacturing use cases from top ranked DX programs

Remote monitoring and maintenance, along with digital supply chain initiatives, will be critical for manufacturers to ensure that they achieve the required levels of visibility that can improve business and operational resilience.

1st ranked program: digital manufacturing

Use case	Use case summary	Technology
Remote asset monitoring and diagnostics	Leveraging technologies such as digital twins and real-time operation data to remotely monitor production and field assets. IDC predicts that by 2024, 33% of A2000 companies will develop all new processes as remote-first designs, compared with the very limited number of remote-first processes in 2020.	AI, BDA, IoT, AR/VR, industry cloud platforms, IT/OT security, application modernization
Collaborative resolution	Intelligent platform that integrates contextual information to automate corrective actions and reduce rework across the complete product and process life cycle.	Big data/analytics, cognitive/AI, IoT, cloud, social, mobile, ERP, and QMS
Asset instrumentation	Real-time data capture through instrumented assets to lower the incidence of unscheduled outages across the shop floor.	Cloud, IoT, ERP, MES, mobility, BI, edge computing, data visualization

2nd ranked program: digital supply chain

Use case	Use case summary	Technology
Supply forecasting & planning	AI-based supply chain forecasts aid in improving planning efficiencies and allow for increased operational resiliencies. IDC predicts that by 2024, 40% of APEJ-based supply chain forecasts will be automated using AI, improving accuracy by 5 percentage points.	Cloud, industry cloud, ML, unstructured data reasoning, prescriptive analytics, IoT, intelligent assistants, and multicloud management
Supply chain resilience	Real-time supply chain data to increase visibility and react to market disruptions quickly to improve value chain efficiencies.	Cloud, IT/OT integration, AI/ML, BDA
Real-time demand matching	Deliver a real-time view into demand to match supply and production with demand and drive down inventory while improving order fulfillment, customer service level, and waste.	Cloud, social, BDA, cognitive processing, AI/ML

Additional use cases to be considered in Manufacturing

Automated asset monitoring capabilities can help manufacturers mitigate skill set availability challenges, while investments in collaborative and coordinated life-cycle platforms will ensure faster product and service innovation drives.

3rd ranked program: strategic asset management

Use case	Use case summary	Technology
Asset performance management	The use of unstructured data to continuously monitor performance will reduce the risk of unscheduled outages and breakdowns. IDC predicts that by 2025, 50% of industry ecosystem participants will leverage their own product, asset, and process digital twins to share data and insights with other participants.	Sensors, smart assets, networks, analytical tools, data management, AI/ML, cloud
Predictive maintenance	Increased availability can lower operational liquidity challenges while ensuring that the process parameters are streamlined and optimized.	IoT, mobility, digital twins, AI, BDA
Autonomous asset tracking	The use of real-time data and automation for tracking asset performance and usage can aid in detecting failure modes quicker and in a timely manner.	Big data/analytics, AI/ML, cloud, mobile, ERP, MES, and SLM

Operational and performance data will be critical to understanding the existing process maturity and performance benchmarks. These data sets are critical to ensuring that there is an innovation platform that is built on sustainability frameworks.

Product innovation platform
Upstream product design and integration with other enterprise applications will be vital to the creation of next-generation products that comply with regulatory requirements and growing demand for mass customization.

Environment and sustainability
Data audits to track carbon emissions and footprint will continue to grow as organizations look to apply sustainable initiatives and circular economy principles to make their products and services more ESG-compliant.

Market highlights:

- **46%** of **Asia/Pacific** LOBs are looking at **strategic and smart asset management** as a core DX program to help lower operational costs and increase visibility
- Due to high levels of manual interventions, a majority of **ASEAN** economies are focused on improving shop floor operations and value chain visibilities through **smart plant and digital manufacturing** initiatives that can help bring in productivity and efficiency benefits
- **38%** of **Asia/Pacific's advanced economies** are focused on logistics automation to improve their fleet management, tracing and end-to-end material movement. The objective is to optimize and reassess transportation management routines that can comply with increasingly stringent sustainability requirements

Essential guidance: what's next in Manufacturing

Data-centered business models provide organizations with the ability to scale, be agile, and in many cases, proactively address bottlenecks. Central to the success of such models is ensuring that the underlying linkages in terms of operational processes are well-defined and robust. Also, the quality of the insights depends heavily on the data inputs and their comprehensiveness, which means that the IT and the OT departments must be well-integrated and aligned with the overall business vision.

Ensure executive buy-in and internal sell-through: Automation drives can be misconstrued, especially in highly manual workspaces. Decisions such as the creation of industrial IoT (IIoT) frameworks with the core objective of capturing asset operational metrics such as asset performance, cycle times, OEE, and first pass yield should be adequately defined and managed to improve productivity and efficiencies, lest they be misinterpreted as a basis for workforce rationalization drives.

Choose an IT strategy based on the existing scalability requirements: The debate between monolithic applications and microservices will continue to play an important role in the overall IT architecture; organizations need to factor in the enterprise applications such as warehouse management systems, transportation management systems, product life-cycle management systems, sales and operations planning to understand the required levels of flexibility and scalability needed to stay relevant and competitive, while being aligned with consumer demand metrics.

Embrace complexity to attain agility: The shift to a multicloud environment could be quite complicated but could invariably reduce costs and enable organizations to innovate faster by launching new products and services. Investing in multivendor environments for industry-specific requirements such as inventory monitoring, fleet scheduling, supplier development, materials requirement planning, line balancing would require substantially less effort in deployments and API integrations, while also reducing the need to invest in complicated app customizations.

Identify and prioritize use cases that provide quick wins: Focus on use cases that can be executed quickly while creating a repository for operational metrics. Smart plant programs around cognitive and AI-led production scheduling and order management could bring in substantial benefits by dynamically aligning internal capacity with external demand.

Message from the Sponsor

Boost innovation and improve quality and throughput at scale with a VMware digital foundation for Industries

VMware is Building the Foundation for Digital Industries with seamless connectivity, latest automation technology, and data intelligence. For industries striving to gain competitive advantage and thrive on the global stage, app and cloud modernization can level up innovation while enhancing operations and security measures essential for real-time connected industries operations. Underpinned by Edge to Cloud, VMware provides a seamless, flexible, open, and secure consistent technology platform capabilities across OT and IT.

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- Help ensure business continuity
- Keep employees productive and safe with flexible, remote workspaces/remote workers
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For more information, please contact: Kristin Sallai – APJ Director Advisory – Application & Cloud Transformation at ksallai@vmware.com

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