

Facing challenges such as security, costs, legacy technology, and a lack of standards, manufacturing organizations are looking to transform their infrastructure to prepare for a digitally connected ecosystem, where data is key to efficiency, safety, and quality.

Asia/Pacific Manufacturing Industry Readies for a Wave of Digital Transformation

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Introduction

Among industries deeply impacted by the COVID-19 pandemic, manufacturing is one of a few that had to contend with disruptions on both the demand and supply sides. Transformation has been on the radar the past two years, as awareness rose. In 2019, 20.2% of manufacturing organizations were unclear about digital transformation, according to IDC Manufacturing Insights Survey 2021. This dropped to only 2.7% in 2021. Like every other industry, the pandemic has accelerated the adoption of digital transformation in this sector. IDC's research points to the rise of several trends as the catalyst in 2022 and beyond:

Digitally connected ecosystem

IDC predicts that by 2022, organizations that share data, applications, and operations with their industry ecosystem will realize a revenue increase of 3 percentage points higher than nonparticipants

IDC research indicates that bridging the ecosystem digital divide is a key initiative for manufacturing organizations going forward. Organizations expect their industry ecosystem partners to function as one team and enable resilience, and innovation. As 2022 progresses, organizations that focus on industry ecosystems will begin to derive a large percentage of their revenue from new business models. This transformation will be realized by taking an open approach with industry ecosystems and utilizing tools such as digital twins to accelerate,

AT A GLANCE

KEY STATS¹

- » Only 23% of manufacturing organizations across Asia/Pacific feel their network is modern enough for a future enterprise.
- » 47% of manufacturing organizations surveyed identify security threats as one of the biggest IT/network challenges, while 41% of organizations list incorporating new/emerging technologies as among top three IT challenges.
- » 33% of manufacturing organizations in Asia/Pacific plan to adopt SD-WAN by 2022 while 34% organizations are already using it now.

IDC OPINION

Multicloud SD-WAN adoption across the manufacturing sector is necessary for accelerated network transformation in a secure, reliable, efficient, and resilient manner.

¹ Source: IDC's Asia/Pacific Enterprise Communications Survey 2021

monetize, and derive value from data, applications, and operation initiatives and opportunities. 5G and SD-WAN are some of the key connectivity technologies that enable tools like digital twins.

Building a data sharing ecosystem

IDC predicts that by 2025, 25% of Asia/Pacific Excluding Japan (APEJ)-based manufacturers will share data in their ecosystems (partners, customers, suppliers), thereby improving operational equipment efficiency (OEE) of their factory operations on average by 10%.

According to IDC's Asia/Pacific Manufacturing Insights Survey 2021, many manufacturers are still using spreadsheets for traditional applications, such as transportation, warehousing, inventory, and planning activities. Even today, a significant number of manufacturers are hesitant to adopt digital technology solutions to increase product and service quality, efficiency, and productivity. IDC's analysis of the revenue and profit performance of digital versus nondigital manufacturers from 2015 to 2021 indicates that digitally enabled manufacturing companies have higher revenue and profit performance than their nondigital peers.

By sharing and exchanging data in a cloud-based industry ecosystem, manufacturers can generate more insights compared to analyzing only data from their own domain. They can also improve the performance of factory operations and their overall equipment effectiveness. A prime example is Google Cloud's supply chain twin (SCT), a solution platform that allows organizations to create a virtual model of their supply chains by amalgamating both structured and unstructured data across the various nodes of suppliers, logistics service providers, and others. SCT supports data types such as enterprise resource planning (ERP), enterprise asset management (EAM), supply chain management (SCM), warehouse management system (WMS), manufacturing execution system (MES), supplier production information, publicly sourced data such as metrological indicators, freight movement, and environmental, social, and governance (ESG). A digital twin like SCT allows data integration across the value chain, so a manufacturer can identify possible delays in real time and implement solutions to reduce or prevent disruption to supply chain operations.

Application sharing across the ecosystem

IDC predicts that by 2024, 25% of APEJ-based manufacturers will share applications with industry ecosystem partners to improve visibility and operational efficiency and ensure safety, security, and quality.

Digitally enhancing products, services, and customer experiences is the top initiative in 2021 for organizations across industries, as is working more closely with industry ecosystem partners for open innovation and meeting customer needs. When organizations state that they will create new digital products and services, this refers to applications and/or complementary services that meet customer needs and improve decision making. Organizations need to be prepared for disruption and the changing needs of the customers. Having the right application in collaboration with other ecosystem participants is critical to achieve digital resiliency. The amount of data that a manufacturing organization contends with, including connected products, assets, processes, and customers, is difficult to leverage without the applications in place that enable collation of information and rapid decision making. Often, this collation includes interrogating multiple related data models to see market and ecosystem trends and needs, and sense quality, safety, or service issues before they occur. Flexibly and securely viewing trusted data in context through shared applications across an industry ecosystem also enables process and governance improvements, along with the optimal usage of human, asset, operational, and financial capital.

Investment priorities and challenges

Investment in cloud infrastructure, software, and platforms is one of the top 3 technology areas of focus for manufacturers, according to IDC's Asia/Pacific Manufacturing Insights Survey 2021. Creating new revenue streams and business models from fully digital and digitally enhanced offerings remains the top priority for manufacturers in the next three to four years of business development.

According to IDC's Worldwide Digital Transformation Spending Guide, manufacturing organizations in Asia/Pacific are expected to increase their DX spending on cloud-related deployments from \$17.7 billion in 2020 to \$69.7 billion in 2025, a compound annual growth rate (CAGR) of 31.6%.

Manufacturing organizations are also looking to prioritize investments in technologies such as IoT, AR/VR, AI, and robotics. Organizations across Asia/Pacific are expected to increase their spending in these technologies from \$12.2 billion in 2020 to \$45.2 billion in 2025, a compound annual growth rate (CAGR) of 31.6%, according to IDC's Worldwide 3rd Platform Spending Guide: Manufacturing Spending Guide.

Digital transformation and investment in new technologies come with their own challenges. According to IDC's Asia/Pacific Enterprise Communications Survey 2021, 41% of manufacturing organizations identify incorporating new/emerging technologies as one of the biggest IT or network challenges while 45% of them list modernizing or automating IT management as another IT challenge.

Manufacturing organizations have the following fundamental challenges to deal with on their digital transformation journeys:

Security

About 47% manufacturing organizations identify security threats as the top IT/network challenge. Transforming manufacturing processes with digital solutions and emerging technology adoption such as IoT, AI, and robotics results in huge volumes of data being generated from different processes. A security breach can disrupt the entire supply chain, stop production, leak personal as well as professional data, and in some cases, may result in business collapse.

Budgetary constraints

The manufacturing industry has always lagged other industries in digital transformation. The prime reason was, and still is, investment capital needed for adopting DX. Building a shared and digitally connected ecosystem (across partners, suppliers, customers) requires significant investments in new tools, technologies, and solutions. Manufacturing organizations have many SMEs as partners and suppliers and these SMEs may not have the means that larger enterprises do to pursue digital transformation on a similar scale. Organizations need a strategic plan to digitalize manufacturing processes and evaluate long term ROI to justify such capital expenditure.

Legacy systems and rigid infrastructure

With evolving technology, changing traditional manufacturing, and upgrading legacy IT equipment become extremely important. Instead of building and maintaining traditional architecture, adopting a composable architecture solution is a better way forward. This means every component is scalable, expendable, and can be continuously upgraded through agile development to meet changing business needs. New equipment and devices such as IoT devices are compatible with cloud-based systems. To analyze data to improve equipment effectiveness, and output, devices must be able to have two-way interactions with existing systems and software. However, most organizations' existing infrastructure is often incompatible with most digital technologies. Hence, it is imperative that organizations modernize their infrastructure to achieve digital manufacturing.

Lack of uniform standards and protocols in Integrating multiple IoT devices

IoT adoption in the manufacturing industry has grown over the last few years. About 44% of manufacturing organizations surveyed across Asia/Pacific have adopted IoT and another 21% plan to do so in 2022. The lack of standards or data protocols for manufacturers of IoT devices leads to manufacturers facing interoperability issues when integrating with existing IT systems and infrastructure. This can also leave networks vulnerable to cyberattacks. Besides, manufacturers mostly work in silos and have their own set of standards and defined procedures. When devices from multiple manufacturers are connected to a single IoT network, there may not be uniform communication among devices, which leads to scalability and data aggregation issues.

Similarly, IoT generates huge amounts of data which can sometimes overwhelm a network. Latency caused by this can result in inaccurate analytics which can negatively affect manufacturing processes.

Strategy: Building a reliable future ready network infrastructure

Manufacturers have a unique and geographically distributed ecosystem of warehouses, channel partners, factories, retailers, and branch offices which needs to be connected seamlessly for a smooth flow of information.

However, only 23% of manufacturing organizations in Asia/Pacific surveyed feel their network is modern and equipped to handle the demands of future enterprise.

As the pandemic forced manufacturing organizations to accelerate the pace of digital transformation and adoption of new technologies, it also put tremendous pressure on legacy WAN setups. It created the need for a reliable, secure network infrastructure to support multiple sites/offices and applications deployed across a multicloud environment.

Figure 1: **Illustration of a Distributed Manufacturing Ecosystem**



Source: IDC, 2022

Switching from a traditional wide-area network (WAN) to a software-defined WAN (SD-WAN) can help manufacturers overcome performance bottlenecks to boost productivity, strengthen business agility, and improve network security.

A multicloud software-defined wide area network (SD-WAN) that offers network administrators centralized control and high network visibility will change the game for manufacturing organizations. As more organizations adopt IoT, SD-WAN will ensure safe and secure traffic for these connected devices in the network.

To build a robust network infrastructure, organizations need to focus on:

Improving connectivity

Manufacturing organizations need to be constantly connected to stakeholders in their upstream and downstream supply chain. Here, SD-WAN can connect organizations of any size. It can also be used within organizations, as IoT devices and other digital technologies increase in usage. Connectivity also gains importance as SD-WAN supports a range of options such as 4G LTE and 5G, in case an organization has factories or warehouses in remote areas where the need for a reliable network for connected devices becomes even more critical.

Scalability and flexibility

Multicloud SD-WAN offers scalability and flexibility that can meet the increasing bandwidth requirements as business grows. SD-WAN, being a cloud-based solution, gives manufacturers the flexibility to adapt to new workload requirements. An multicloud SD-WAN can enable organizations to add new branch offices and other ecosystem stakeholders in the existing network without disrupting the current infrastructure. According to IDC's research, around 29% of manufacturing organizations in Asia/Pacific consider an on-demand/flexible connectivity mix as the top benefit when opting for multicloud SD-WAN adoption.

Security

An ideal SD-WAN solution will have integrated security features and provide a firewall, malware protection, and threat detection and response services. With the amount of data generated by connected IoT devices, its security becomes even paramount. It is important that malicious actors don't steal manufacturers' intellectual or proprietary data or any kind of individual personal data. SD-WAN ensures that traffic within the network is encrypted, and a network administrator can manage and implement the security policies from a centralized location.

Cost benefits

IDC's research shows that lower network/WAN costs are among the top benefits besides on-demand or flexible connectivity and intelligent traffic routing, which organizations consider as important when adopting multicloud SD-

SD-WAN, being a cloud-based solution, gives manufacturers the flexibility to adapt to new workload requirements.

WAN. SD-WAN offers lower connectivity costs, high reliability and improved performance, leading to long-term savings and high return on investment.

Industry case studies

Manufacturing organizations across the world have seen significant benefits of adopting multicloud and implementing SD-WAN. IDC's research in Asia/Pacific shows that 33% of manufacturing organizations plan to adopt SD-WAN by 2022 while another 34% of manufacturing organizations are already using it. Similarly, IDC expects multicloud networking revenue in Asia/Pacific to grow at a CAGR of 102% between 2021 and 2026 (\$15.9 million in 2021 to \$534.3 million in 2026). Below are case studies of manufacturing organizations achieving significant milestones in network transformation with the adoption of multicloud SD-WAN:

Multicloud SD-WAN deployment for a digital workplace

A leading manufacturing and distribution organization across the United Kingdom and Europe began migration to the cloud and embarked on a journey to improve its digital workplace by deploying SD-WAN. It wanted a fast, cost-effective and low-risk migration of services. With SD-WAN, it achieved far reaching benefits, including significant improvement in WAN/LAN performance and incident management, considerable cost savings in overall bandwidth and hardware spend, and greater security and agility with SD-WAN.

Re-architecture of the WAN, with SD-WAN replacing legacy WAN and MPLS

A leading Asia/Pacific manufacturing group, which manufactures printed circuit boards and other components, needed a complete re-architect of its network, moving from its current legacy MPLS WAN to SD-WAN. The group needed to improve its IT strategy to keep up with customer demands and improve the network between manufacturing plants and its offices in mainland China, Hong Kong, the Philippines, and Thailand. With an SD-WAN solution, the manufacturing group digitally transformed its operations and established better connections between manufacturing plants and its offices. SD-WAN provided the foundation and bandwidth needed to adopt cloud applications and implement IoT in the manufacturing plants for further operational efficiency. For a geographically distributed organization, SD-WAN played an important role in lowering both capex and opex, enhancing cloud connectivity and increasing network performance with improved security.

Moving forward in the new normal

With rapid digital transformation and adoption of IoT, AI technologies, manufacturing organizations will need robust network infrastructure more than ever. Here, multicloud SD-WAN is uniquely positioned to provide future-proof infrastructure that is built for new features and capabilities. It is expected to meet increasingly stringent regulatory, security and reliability requirements. IDC also expects enterprises undergoing network transformation to take the approach of what IDC refers to as software-defined branch (SD-branch), which is integrated management of campus and branch technologies such as SD-WAN, WLAN, and LAN. As they take a step forward, organizations need to remember to:

- » **Choose the right partner** – Look for a partner with technology capabilities and solutions that align with the organization's objectives. Work with the partner to assess resources and tap the provider's industry experience to identify gaps in existing networks. Some large-scale public cloud providers may offer limited support and resources while smaller third-party providers may offer better resources and industry expertise.

- » **Choose the right telecom carrier** – Without proper network connectivity or reach, manufacturing organizations will be challenged to digitally transform. Manufacturing organizations need a carrier that has a geographically diverse, fast, and reliable network, with strategic investments in technology and innovation toward enhancing application performance, providing strong multitier security while keeping a check on costs. A telecom carrier that keeps current with evolving technology trends can be a big help in the transformation journey to achieve operational efficiencies and increase business resilience.
- » **No compromise on security** – Assess the security controls and processes provided by the cloud provider and ensure that its security system aligns with local compliance laws and the manufacturing organizations' internal security protocols. Mitigating security risks with a multicloud approach is critical to reduce the threat of a devastating attack that deeply impacts the organization.

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For more information: <https://www.telstra.com.sg/en>

About VMware

VMware SD-WAN by VeloCloud simplifies branch WAN networking by automating deployment and improving performance over private, broadband Internet and LTE links for today's increasingly distributed enterprises, as well as service providers.

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