NAVIGATE YOUR DIGITAL TRANSFORMATION WITH CLOUD

MANUFACTURING INDUSTRY VIEW

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INTRODUCTION

Infosys' experience shows that while manufacturers have accepted the cloud, however, the adoption rate is slowed down by a host of operational constraints related to existing legacy systems, right cloud approach, resources, and budgets.

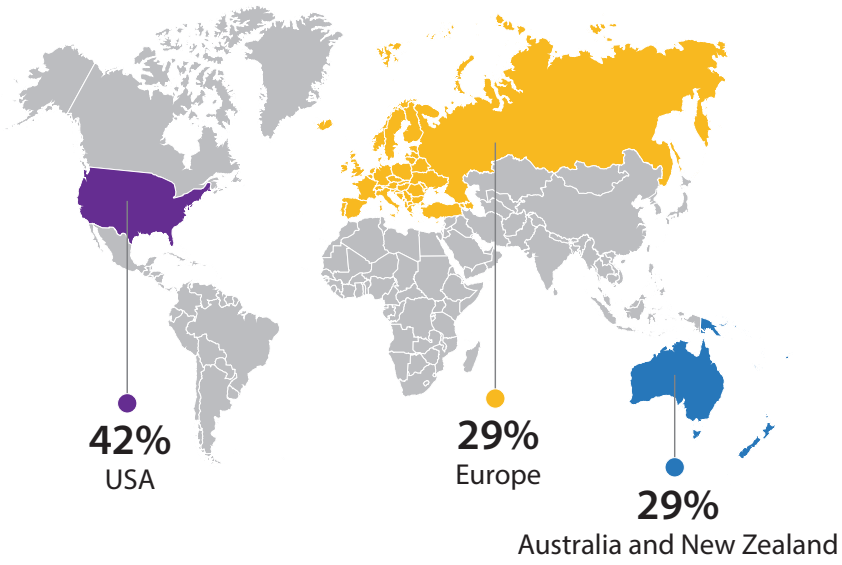
The manufacturing industry continues its quest for increased efficiencies, reduced costs, and better business performance. To pursue these goals successfully, manufacturers need real-time access to critical data, collaboration across the supply chain, smart shop floors, and faster production.

Advanced technologies such as the "internet of things", cloud computing, blockchain, and data analytics are changing manufacturing into a more digitized, intelligent, and personalized industry. These technologies must work in harmony with strategy and operations to transform the business and deliver significant value. Cloud computing has become an essential part of a manufacturer's digital transformation strategy as it brings in much-needed speed, scale, and agility to operations.

Infosys' experience shows that while manufacturers have accepted the cloud, however, the adoption rate is slowed down by a host of operational constraints related to existing legacy systems, right cloud approach, resources, and budgets.

Infosys surveyed 157 executives from manufacturing companies with over US$ 1 billion in revenues across the United States, Europe, Australia and New Zealand (ANZ). The respondents were senior executives and leaders involved in cloud initiatives representing both technology and business functions.

Figure 1: Respondent geographies



The study aims to get a thorough understanding of the ongoing and future cloud initiatives, both from strategic and implementation perspectives and present the findings in this report.

THE CLOUD CAST

Types of enterprise players

The survey received respondents' views on the intensity of cloud adoption as well as their plans for implementation of cloud programs over the next three years. The analysis of the responses showed where the cloud programs were heading. Based on the direction of the cloud program, we identified four distinct types of enterprises.

	Torchbearers 66%	Pathfinders 11%	Defenders 12%	Aspirants 11%
What are the characteristics of this cluster?	Enterprises with high adoption of cloud across functions, and seek to be fully integrated and a cloud-first organization	Enterprises with moderate cloud adoption, and actively seek to derive more business value from the cloud	Enterprises that understand the importance of cloud, but have a siloed approach and unsure about how to derive business value from the cloud	Enterprises with low adoption of cloud across functions, and mostly have a tactical approach towards the cloud
Do they have an enterprise-wide strategy?	Yes, and it is strictly followed	Yes, and it is strictly followed or serves as a guideline	Yes, and it serves as a guideline	Yes, and it serves as a guideline
What drives them to adopt cloud programs?	1. Emerging technologies 2. Competitive activity 3. Evolving customer needs	1. Reduced IT costs 2. Changing partner ecosystem 3. Emerging technologies, competitive activity	1. Data security 2. Reduced IT costs 3. Emerging technologies	1. Emerging technologies 2. Reduced IT costs 3. Competitive activity, data security
What are the expected outcomes from cloud programs?	1. Standardize and integrate technology landscape 2. Enhance customer experience 3. Reduce time to market	1. Standardize and integrate technology landscape 2. Enhance enterprise-wide mobility and collaboration 3. Enhance customer experience, reduce time to market	1. Reduce time to market 2. Increase reach of business 3. Standardize and integrate technology landscape	1. Innovate to get competitive advantage 2. Standardize and Integrate technology landscape 3. Maximize cloud computing capabilities

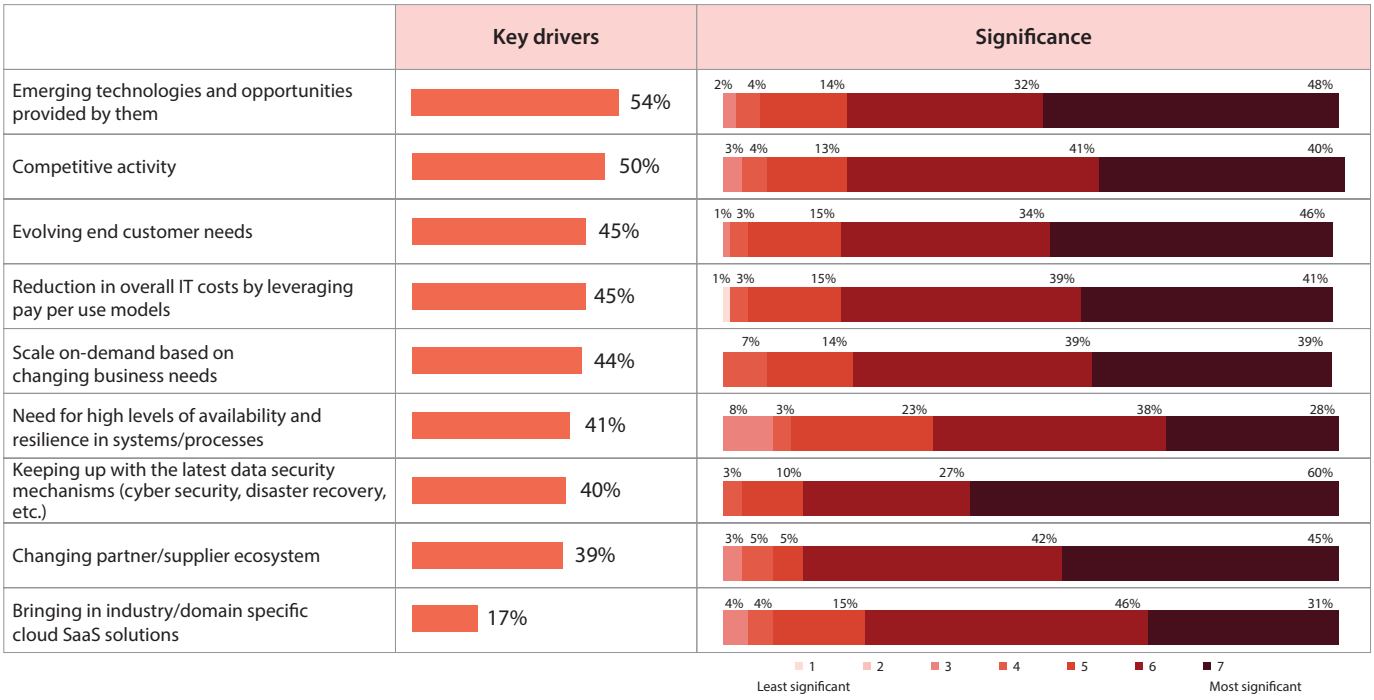
Understanding the drivers and expectations from cloud initiatives

The critical drivers across manufacturers included emerging technologies and the opportunities they offered, competition, evolving customer needs, and a desire to reduce IT costs. Cloud programs can enhance speed, flexibility and scale of manufacturing operations, thereby pushing manufacturers closer to their business goals. European respondents ranked all drivers high, except for competition.

The drivers that influence the pace of decision-making the most are data security, high availability, and resilience of systems and processes.

The drivers that influence the pace of decision-making the most are data security, high availability, and resilience of systems and processes. The survey findings show that operational factors propel action on cloud programs, whereas strategic factors influence the move to the cloud.

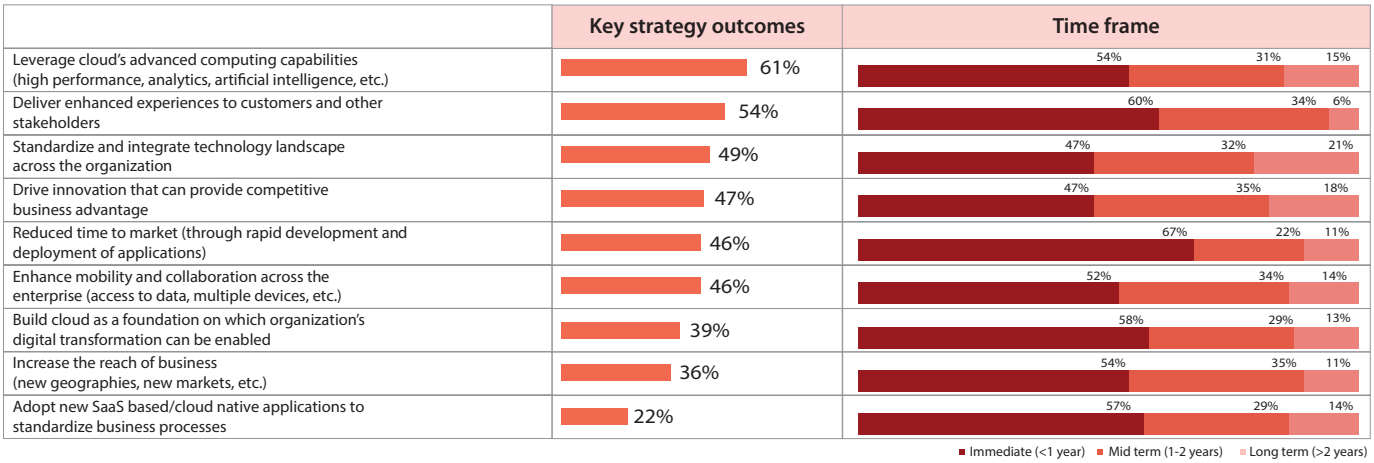
Figure 2: Cloud adoption drivers and their significance on decision-making



Manufacturers expect operational outcomes from their cloud programs such as a standardized and integrated technology landscape, reduced time to market, and enhanced enterprise-wide mobility and collaboration.

Respondents expect to reduce time to market and enhance customer experience within a year. The U.S. and European responses echoed these priorities. Intense global competition and a desire to optimize valuable resources propel manufacturers to accelerate time to market.

Figure 3: Key expected outcomes and timeframes for achieving them



> *Our organization is increasing its focus on IoT across various functions. Due to this our cloud strategy is mostly revolving around public cloud. The bandwidth that is required for our analysis can be easily accommodated. If we try to do this in a private cloud, we will need to invest a significantly larger capital. Based on the technologies we are focusing on, the preference of the cloud model is also changing, many of my industrial peers are also looking at public cloud.*
>
> *– SVP at a manufacturing firm in Europe*

The top three concerns expressed by manufacturers before starting cloud programs were deciding the right cloud approach (53 percent), stakeholder confidence around return on investment (46 percent) and significant reliance on external solutions providers (45 percent). Here again, the views of European and U.S. respondents reflected the overall view. The Pathfinders cluster was most apprehensive about selecting the right cloud approach.

While there is an abundance of information on the different cloud approaches, enterprises still struggle with making the right choice as they weigh in factors such as existing legacy systems, lack of required talent and inadequate resources.

Figure 4: Concerns before launching cloud programs

	Total	Geography		
		ANZ	EU	USA
Stakeholder confidence around return on investment	**46%**	**49%**	**44%**	**45%**
Deciding on the cloud approach to adopt	**53%**	**51%**	**53%**	**53%**
Significant reliance on external solutions providers	**45%**	**40%**	**44%**	**50%**
Availability of internal talent to manage the transition	**41%**	44%	44%	37%
Alignment between IT and business on the road map	**37%**	53%	24%	34%
Accountability and need for a dedicated team to drive the transition	**32%**	51%	29%	19%
Organizational readiness and maturity of existing IT landscape	**33%**	31%	31%	35%
Building strategic and operational road maps	**30%**	38%	27%	26%
Overcoming postmigration challenges	**24%**	31%	20%	23%
Concerns with respect to enterprise information security	**25%**	24%	27%	24%
Need to continuously upgrade to new technologies	**27%**	36%	20%	26%

UNDERSTANDING CLOUD IMPLEMENTATION EXPERIENCES

Respondents view aligning existing legacy systems and collaboration with external services providers and resources with cloud skill sets as the most significant challenges. Australia and New Zealand manufacturers rated all the challenges almost equally. U.S. respondents felt aligning existing legacy systems was a key challenge (85 percent), whereas European respondents thought it was collaborating with external services providers (84 percent). Manufacturing firms have a vast portfolio of aging systems, necessary for running the business but seldom easy to transition to newer platforms.

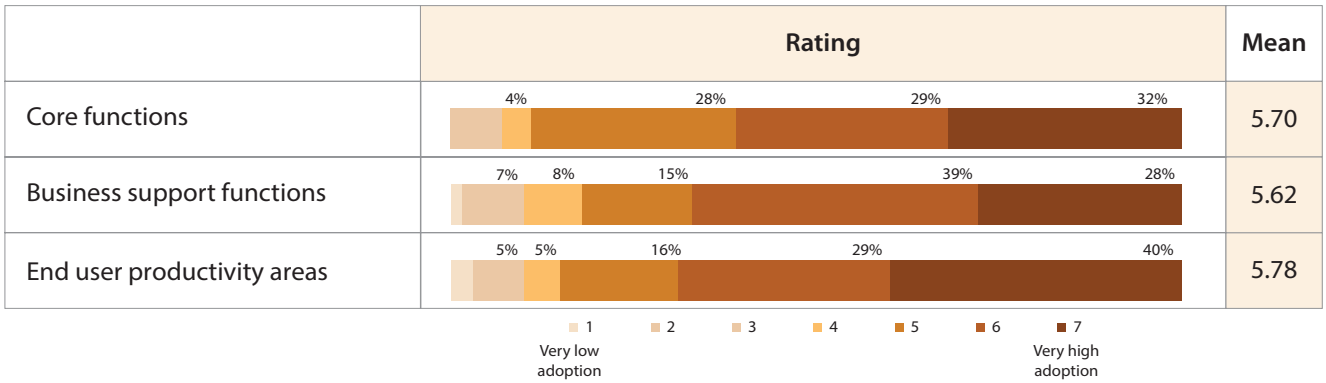
Figure 5: Challenges faced during implementation

	Overall
Application refactoring/tweaking to suit cloud architectures	5.57
Tracking and monitoring systems/processes on cloud	5.59
Aligning existing legacy systems/architectures and technology environments	5.68
Resource skillsets with cloud orientation	5.66
Accurate estimation of time and financial costs involved	5.64
Pace of execution/implementation of the initiative	5.50
Deciding on choice of tools/technologies to pick from	5.63
Maintaining current services levels during transition	5.55
Lack of high levels of clarity in the execution roadmap	5.50
Absence of an internal dedicated cloud team to drive the initiative	5.52
Promoting a culture change within the organization	5.65
Collaboration/integration with external service providers/stakeholders	5.68
Navigating existing agreements	5.49

On the scale of 7

Manufacturing firms have adopted cloud programs more across the end-user productivity (69 percent) and business support (67 percent) functions compared with the core (61 percent) function. Australia and New Zealand led the way in adopting cloud programs across the first two functions, whereas U.S. firms (71 percent) were more open to embracing the cloud for core functions. Europe lagged in cloud adoption across all functions.

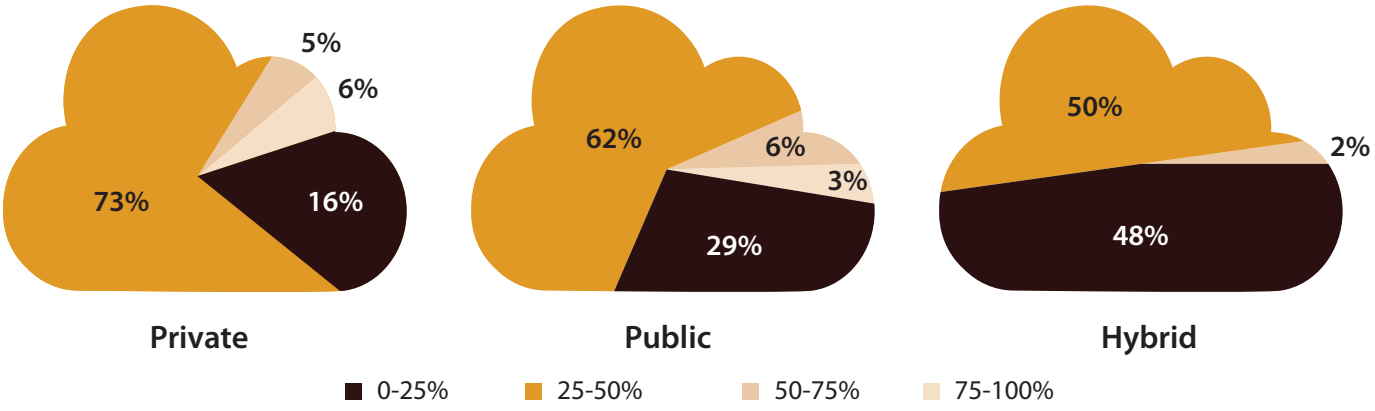
Figure 6: Cloud adoption across functions



The respondents were familiar with all three cloud models — private, public and hybrid. While private cloud is still dominant (73 percent) in the 25 to 50 percent workload category, public cloud models are not far behind (62 percent).

Manufacturers lean toward hybrid (48 percent) and public (29 percent) cloud models for the less-than-25 percent workloads. Australia and New Zealand manufacturers have been more aggressive, with public (62 percent) and hybrid cloud (63 percent) adoption for 25 to 50 percent workloads. The U.S. lags behind Australia and New Zealand and Europe in adopting public and hybrid cloud models.

Figure 7: Workload spread across the cloud models



Cost benefits and higher control over data are the standout gains from the private cloud.

Respondents select the public cloud to maximize benefits such as regulatory compliance, seamless integration, standardized systems, scalability, availability and faster upgrades to IT systems. Cost benefits and higher control over data are the standout gains from the private cloud.

A fully integrated, cloud-first organization promises transformational benefits.

A significant 42 percent, including 63 percent of Torchbearers, 50 percent of U.S. respondents and 41 percent of European respondents, plan to pursue this goal. Fifty-one percent of Australia and New Zealand respondents and 76 percent of Pathfinders seek to adopt an everything-as-a-service model.

The cloud may begin with the boardroom, but it ends with IT leaders

The business executive leadership contributes significantly to defining the requirements and making the final decisions. IT leadership, on the other hand, is involved throughout the cloud journey emphasizing the importance of the initiative.

The most common criteria used to evaluate external solutions providers include the breadth of services offered (42 percent), capability to manage large transformational programs (41 percent) and credibility (40 percent).

New technologies will have a tangible impact on the cloud

Respondents view artificial intelligence and machine learning (46 percent), big data (45 percent), DevOps (44 percent), and the internet of things (38 percent) technologies as the most value-adding when adopted with the cloud.

Figure 8: Technologies impacting adoption of the cloud

	Overall	Geography		
		ANZ	EU	USA
Artificial Intelligence/Machine Learning	46%	44%	48%	45%
Big data analytics	45%	40%	39%	52%
DevOps	44%	42%	46%	44%
Internet of Things (IoT)	38%	36%	28%	47%
Open-source (microservices, APIs)	36%	42%	39%	30%
Edge computing	32%	40%	28%	30%
Hyperconvergence	31%	33%	39%	24%
Containers and Orchestration	27%	22%	33%	27%

NEXT STEPS IN THE CLOUD JOURNEY FOR MANUFACTURERS

The progressive Torchbearers, comprising 66 percent of respondents in our study, with their high cloud adoption and ambitious plans, have set a benchmark for other manufacturers to follow.

Cloud computing enables manufacturers to join the digital bandwagon and handle business demands more effectively.

The progressive Torchbearers, comprising 66 percent of respondents in our study, with their high cloud adoption and ambitious plans, have set a benchmark for other manufacturers to follow. The Infosys study revealed that prevalence of legacy systems, inability to make informed decisions and lack of skilled resources constrain manufacturing firms from aggressively pushing the cloud agenda. However, the benefits offered are too significant and valuable to be ignored.

Infosys' experience shows that the cloud journey cannot be successfully navigated with only in-house expertise. Manufacturers must align with a competent partner that can contribute on both the business and technology aspects. In addition, the partner must be able to provide sound advice and function as a reliable implementation partner.

About Infosys Knowledge Institute

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